FIG.1
PRIOR ART

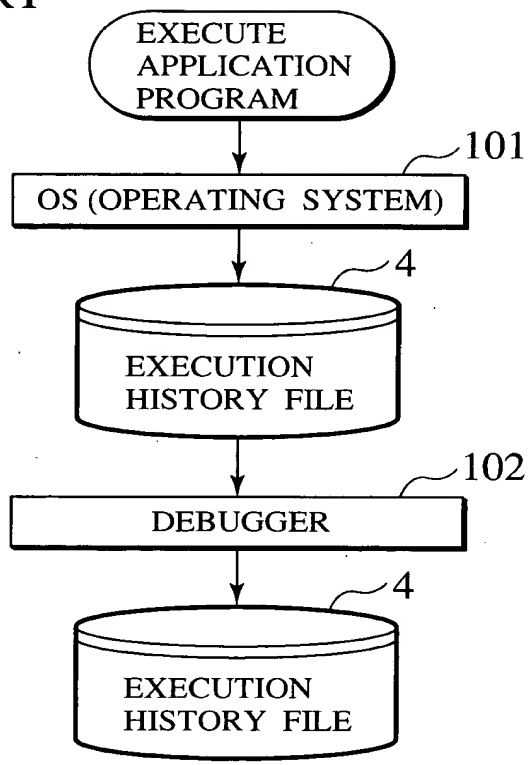


FIG.2
PRIOR ART

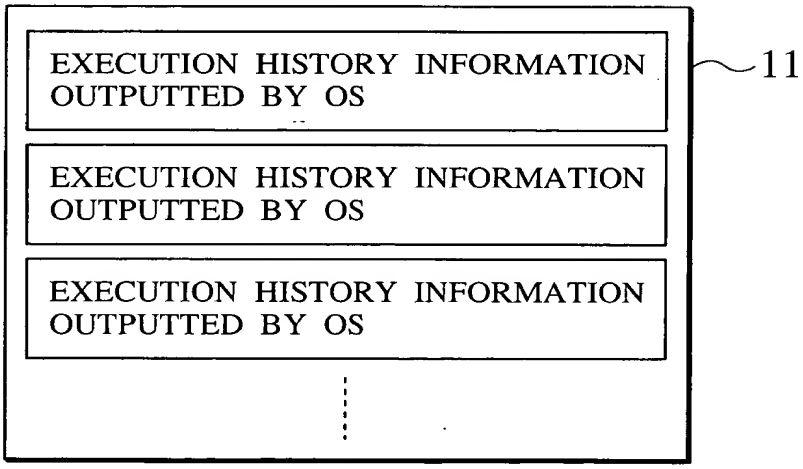


FIG.3A
PRIOR ART

type	oid	sysid	obj

FIG.3B
PRIOR ART

6	0	1		··· (i)
1	1	-9	2	··· (ii)
1	1	-9	3	··· (iii)
1	1	-17		··· (iv)
6	1	3		··· (v)
1	3	-19	1	··· (vi)
6	3	1		··· (vii)
	⋮			

WHERE
sysid : sta_txt ... -9
: ext_txt ... -10
: slp_txt ... -17
: wup_txt ... -19

FIG.4

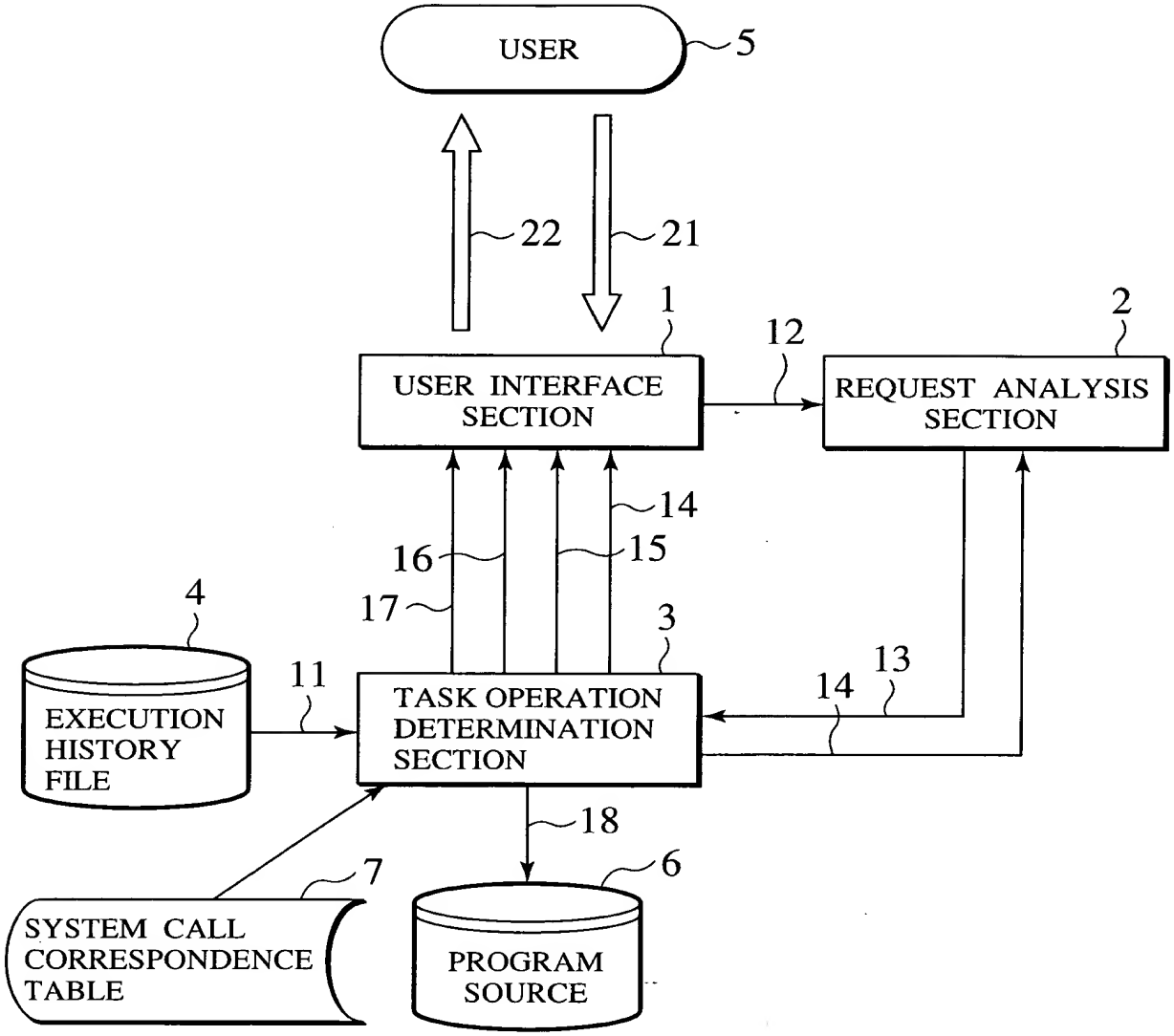

USER
5
22
21
1
2
12
USER INTERFACE SECTION
REQUEST ANALYSIS SECTION
14
16
15
17
3
4
13
11
14
EXECUTION HISTORY FILE
TASK OPERATION DETERMINATION SECTION
18
7
6
SYSTEM CALL CORRESPONDENCE TABLE
PROGRAM SOURCE

FIG.5

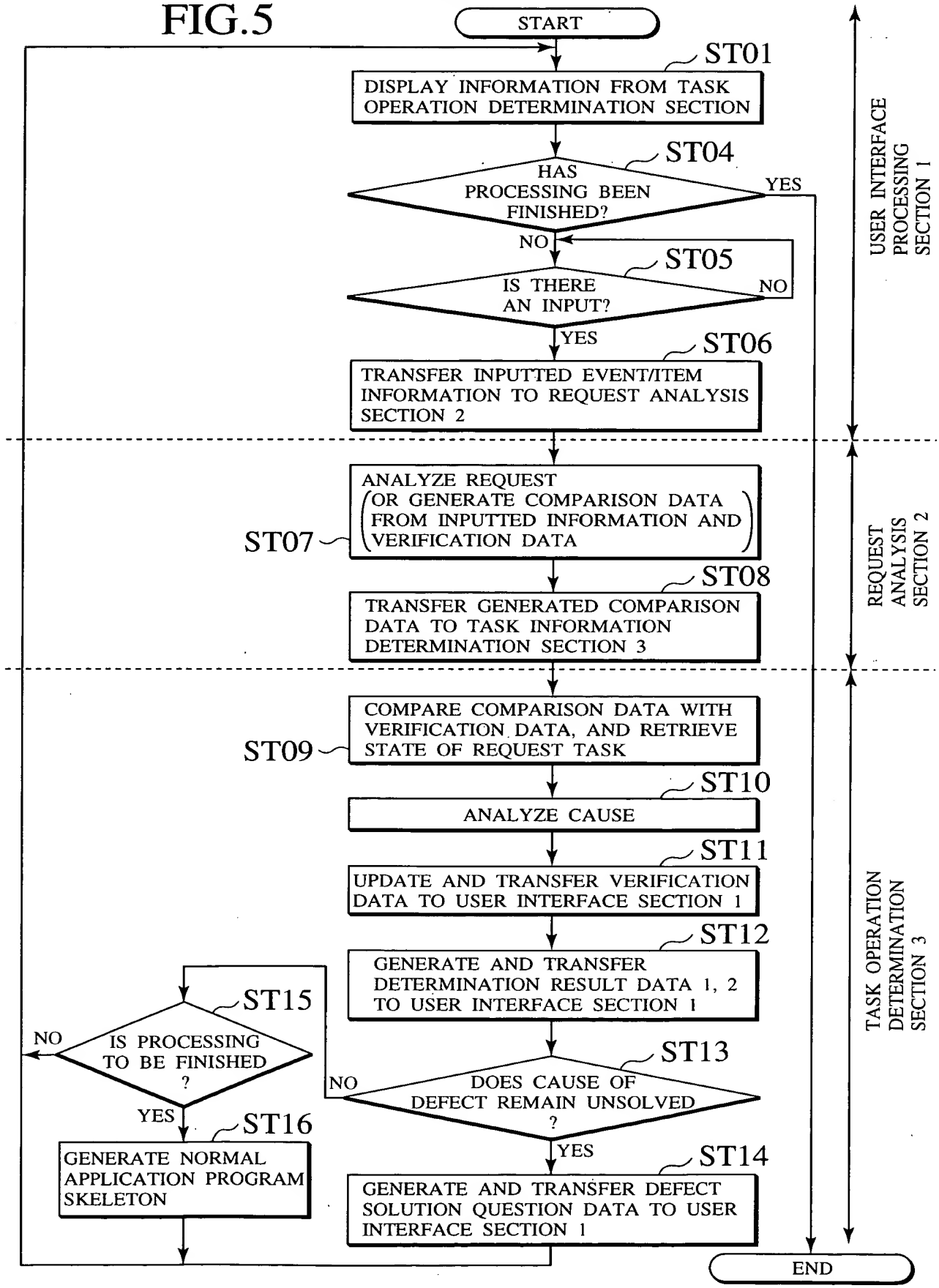

START
ST01
DISPLAY INFORMATION FROM TASK OPERATION DETERMINATION SECTION
ST04
HAS PROCESSING BEEN FINISHED?
YES
NO
ST05
IS THERE AN INPUT?
NO
YES
ST06
TRANSFER INPUTTED EVENT/ITEM INFORMATION TO REQUEST ANALYSIS SECTION 2
ST07
ANALYZE REQUEST (OR GENERATE COMPARISON DATA FROM INPUTTED INFORMATION AND VERIFICATION DATA
ST08
TRANSFER GENERATED COMPARISON DATA TO TASK INFORMATION DETERMINATION SECTION 3
ST09
COMPARE COMPARISON DATA WITH VERIFICATION DATA, AND RETRIEVE STATE OF REQUEST TASK
ST10
ANALYZE CAUSE
ST11
UPDATE AND TRANSFER VERIFICATION DATA TO USER INTERFACE SECTION 1
ST12
GENERATE AND TRANSFER DETERMINATION RESULT DATA 1, 2 TO USER INTERFACE SECTION 1
ST13
DOES CAUSE OF DEFECT REMAIN UNSOLVED ?
NO
YES
ST14
GENERATE AND TRANSFER DEFECT SOLUTION QUESTION DATA TO USER INTERFACE SECTION 1
ST15
IS PROCESSING TO BE FINISHED ?
NO
YES
ST16
GENERATE NORMAL APPLICATION PROGRAM SKELETON
END
USER INTERFACE PROCESSING SECTION 1
REQUEST ANALYSIS SECTION 2
TASK OPERATION DETERMINATION SECTION 3

FIG.6

ORDER OF EVENTS	EVENT ATTRIBUTE (ISSUANCE OF SYSTEM CALL)	ISSUED SYSTEM CALL	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY
ORDER OF EVENTS	EVENT ATTRIBUTE (DISPATCH)	DISPATCH ORIGINATION TASK ID	DISPATCH ORIGINATION TASK PRIORITY	DISPATCH DESTINATION TASK ID
ORDER OF EVENTS	EVENT ATTRIBUTE (INTERRUPTION PROCESSING	HANDLER ATTRIBUTE (CYCLE START HANDLER, ALARM HANDLER, INTERRUPTION HANDLER	HANDLER NO.	—
⋮	⋮	⋮	⋮	⋮

TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
DISPATCH DESTINATION PRIORITY	—	—	—
—	—	—	—
⋮	⋮	⋮	⋮

EVENT ATTRIBUTE : ISSUANCE OF SYSTEM CALL
DISPATCH INTERRUPTION PROCESSING
HANDLER ATTRIBUTE : CYCLE START HANDLER
ALARM HANDLER
INTERRUPTION HANDLER

FIG.7

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
	⋮	⋮	⋮

TIMING (X)

FIG.8

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK
⋮	⋮	⋮
⋮	⋮	⋮

FIG.9

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk
⋮	⋮	⋮
⋮	⋮	⋮

FIG.10

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE
⋮	⋮	⋮
⋮	⋮	⋮

FIG.11

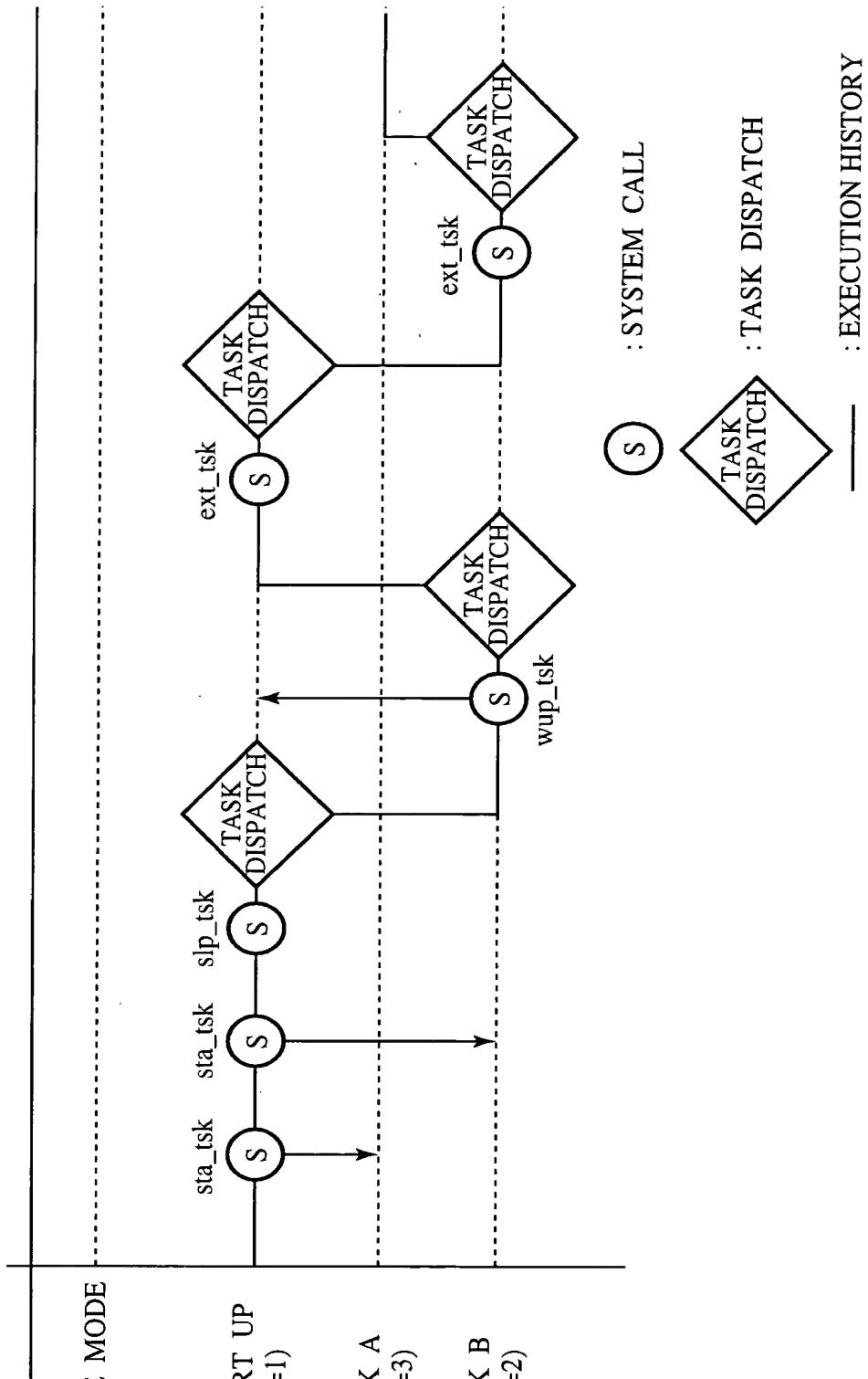

IDLE MODE
START UP
(PRI=1)
TASK A
(PRI=3)
TASK B
(PRI=2)
sta_tsk
sta_tsk
slp_tsk
ext_tsk
wup_tsk
ext_tsk
S
TASK DISPATCH
: SYSTEM CALL
: TASK DISPATCH
: EXECUTION HISTORY

FIG.12

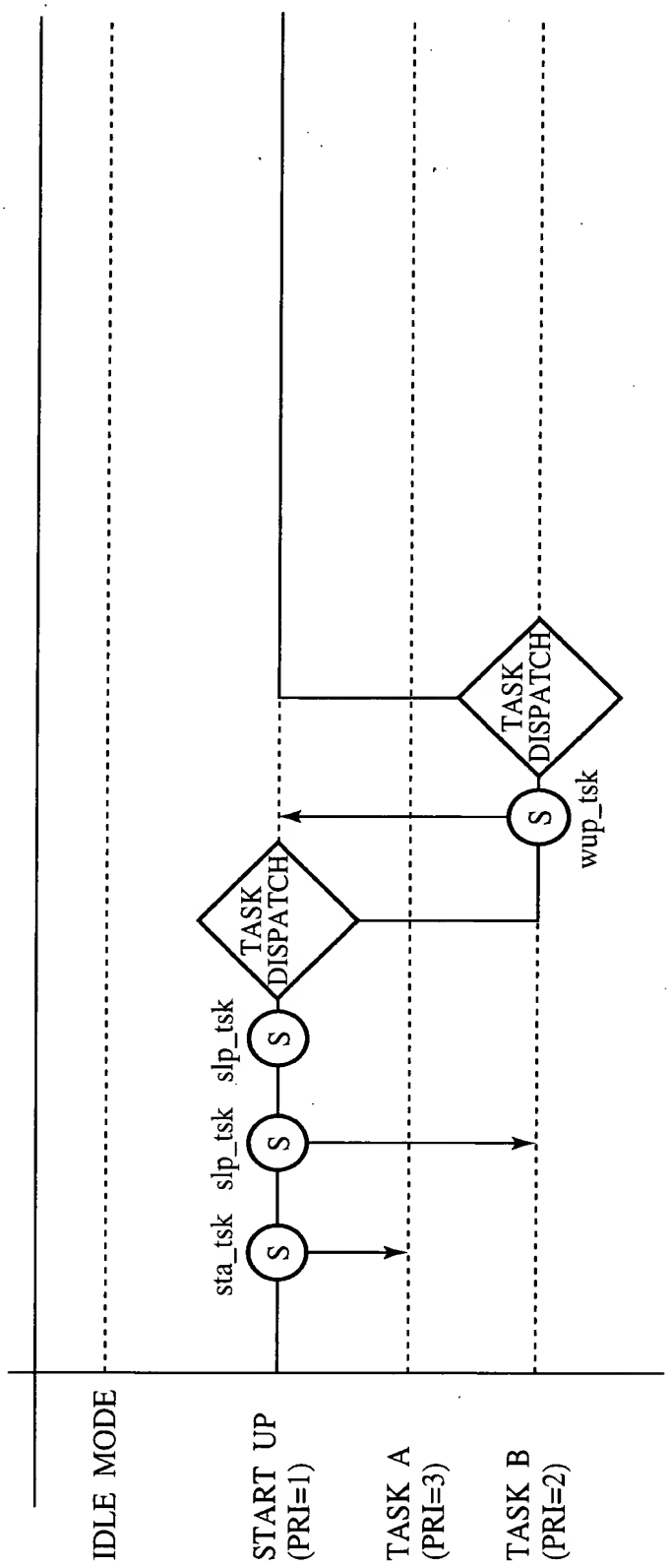

IDLE MODE
START UP
(PRI=1)
TASK A
(PRI=3)
TASK B
(PRI=2)
sta_tsk
slp_tsk
slp_tsk
S
S
S
TASK
DISPATCH
TASK
DISPATCH
S
wup_tsk

FIG.13

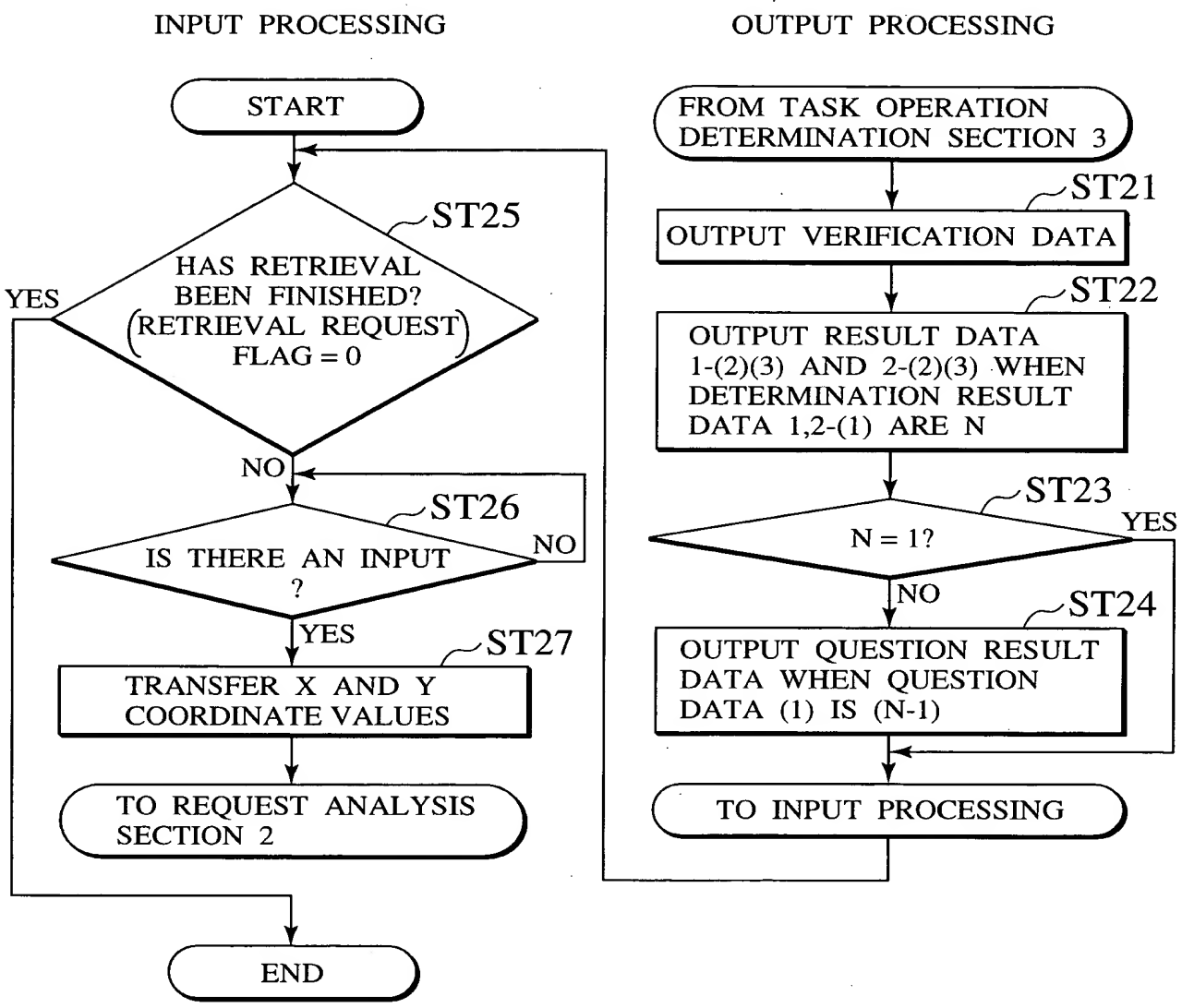
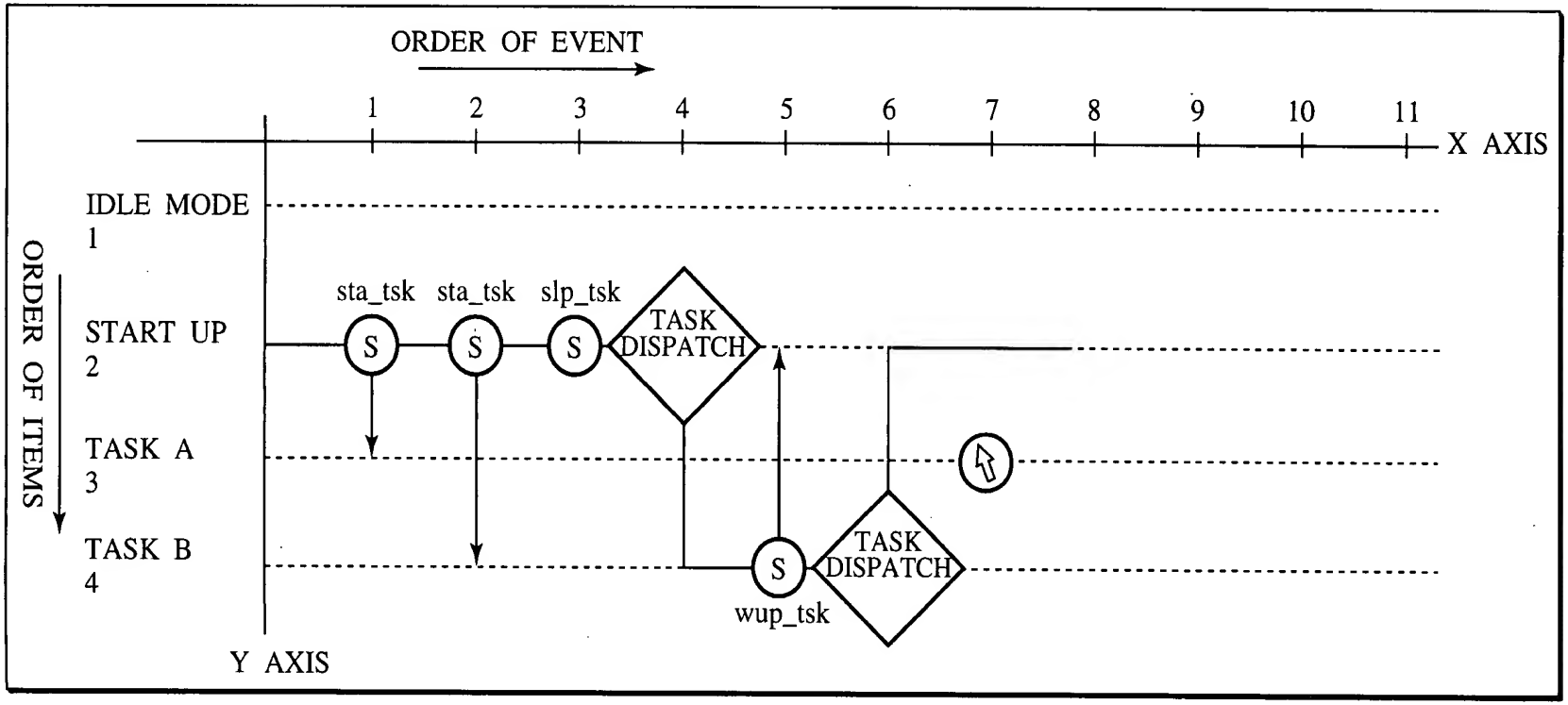

INPUT PROCESSING
OUTPUT PROCESSING
START
ST25
HAS RETRIEVAL BEEN FINISHED? (RETRIEVAL REQUEST FLAG = 0)
YES
NO
ST26
IS THERE AN INPUT ?
NO
YES
ST27
TRANSFER X AND Y COORDINATE VALUES
TO REQUEST ANALYSIS SECTION 2
END
FROM TASK OPERATION DETERMINATION SECTION 3
ST21
OUTPUT VERIFICATION DATA
ST22
OUTPUT RESULT DATA 1-(2)(3) AND 2-(2)(3) WHEN DETERMINATION RESULT DATA 1,2-(1) ARE N
ST23
N = 1?
YES
NO
ST24
OUTPUT QUESTION RESULT DATA WHEN QUESTION DATA (1) IS (N-1)
TO INPUT PROCESSING

FIG.14



INPUT CONDITIONS : ONLY LINE INDICATING EXECUTION HISTORY CAN BE DEFINED

: MOUSE CURSOR

MAKE MOUSE CURSOR CLOSER TO PLACE TO WHICH SYSTEM CALL IS TO BE ISSUED

X AXIS	7
Y AXIS	3

FIG.15

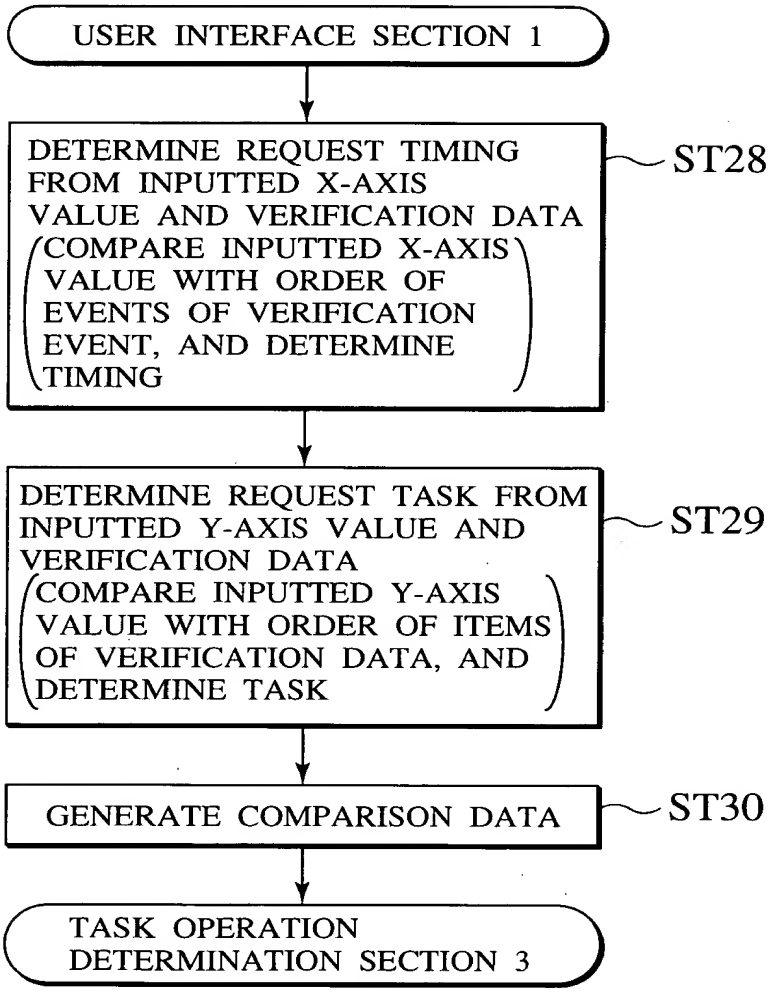
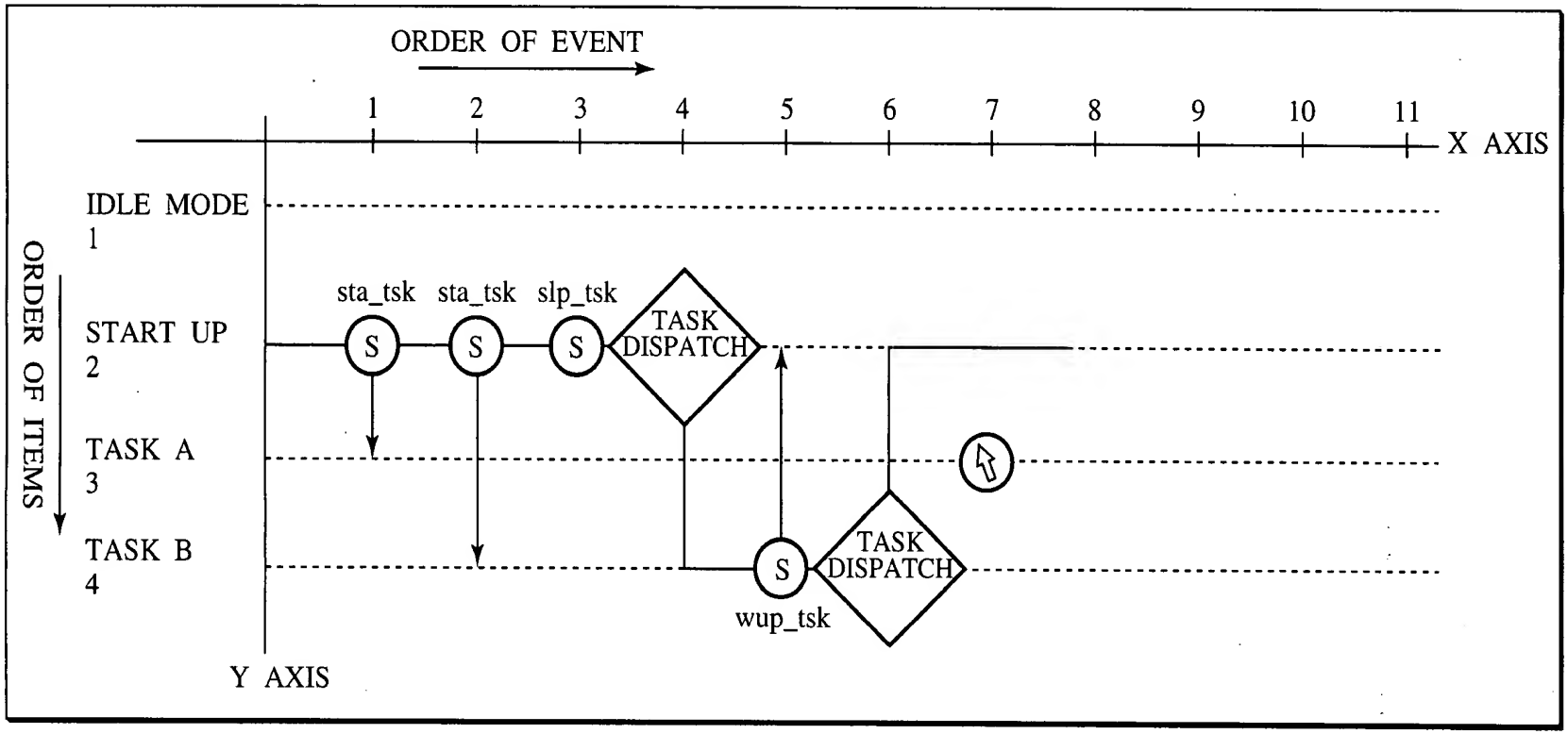

USER INTERFACE SECTION 1
DETERMINE REQUEST TIMING FROM INPUTTED X-AXIS VALUE AND VERIFICATION DATA (COMPARE INPUTTED X-AXIS VALUE WITH ORDER OF EVENTS OF VERIFICATION EVENT, AND DETERMINE TIMING
ST28
DETERMINE REQUEST TASK FROM INPUTTED Y-AXIS VALUE AND VERIFICATION DATA (COMPARE INPUTTED Y-AXIS VALUE WITH ORDER OF ITEMS OF VERIFICATION DATA, AND DETERMINE TASK
ST29
GENERATE COMPARISON DATA
ST30
TASK OPERATION DETERMINATION SECTION 3

FIG.16



IF MOUSE CURSOR IS MADE CLOSER TO PLACE TO WHICH SYSTEM CALL IS TO BE ISSUED

(FIRST INPUT)

X AXIS	7
Y AXIS	3

COMPARISON DATA

1	7	7	TASK A

REQUEST TIMING REQUEST TASK

FIG.17

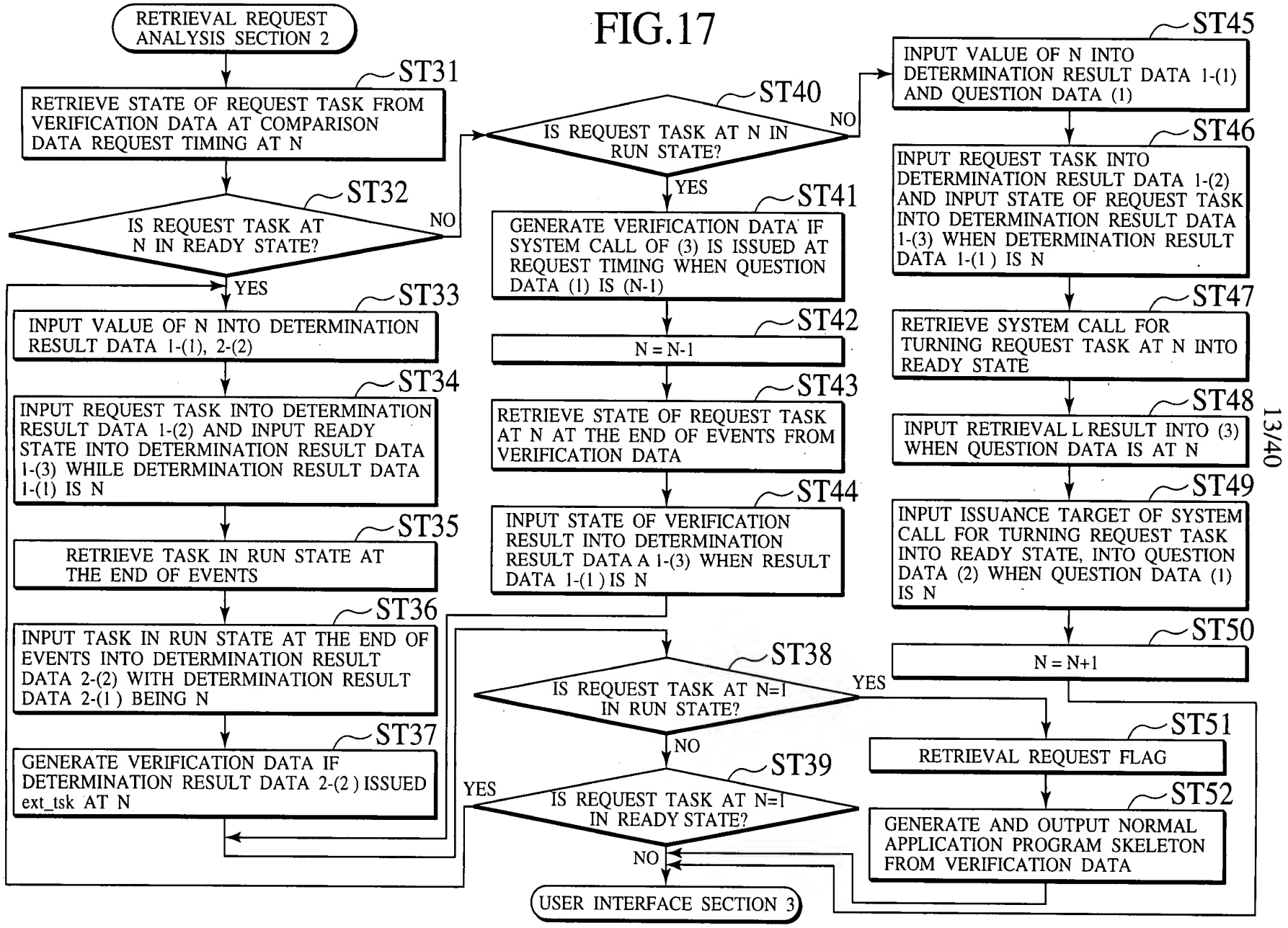

RETRIEVAL REQUEST ANALYSIS SECTION 2
ST31
RETRIEVE STATE OF REQUEST TASK FROM VERIFICATION DATA AT COMPARISON DATA REQUEST TIMING AT N
ST32
IS REQUEST TASK AT N IN READY STATE?
NO
YES
ST33
INPUT VALUE OF N INTO DETERMINATION RESULT DATA 1-(1), 2-(2)
ST34
INPUT REQUEST TASK INTO DETERMINATION RESULT DATA 1-(2) AND INPUT READY STATE INTO DETERMINATION RESULT DATA 1-(3) WHILE DETERMINATION RESULT DATA 1-(1) IS N
ST35
RETRIEVE TASK IN RUN STATE AT THE END OF EVENTS
ST36
INPUT TASK IN RUN STATE AT THE END OF EVENTS INTO DETERMINATION RESULT DATA 2-(2) WITH DETERMINATION RESULT DATA 2-(1) BEING N
ST37
GENERATE VERIFICATION DATA IF DETERMINATION RESULT DATA 2-(2) ISSUED ext_tsk AT N
ST40
IS REQUEST TASK AT N IN RUN STATE?
NO
YES
ST41
GENERATE VERIFICATION DATA IF SYSTEM CALL OF (3) IS ISSUED AT REQUEST TIMING WHEN QUESTION DATA (1) IS (N-1)
ST42
N = N-1
ST43
RETRIEVE STATE OF REQUEST TASK AT N AT THE END OF EVENTS FROM VERIFICATION DATA
ST44
INPUT STATE OF VERIFICATION RESULT INTO DETERMINATION RESULT DATA A 1-(3) WHEN RESULT DATA 1-(1) IS N
ST38
IS REQUEST TASK AT N=1 IN RUN STATE?
YES
NO
ST39
IS REQUEST TASK AT N=1 IN READY STATE?
YES
NO
USER INTERFACE SECTION 3
ST45
INPUT VALUE OF N INTO DETERMINATION RESULT DATA 1-(1) AND QUESTION DATA (1)
ST46
INPUT REQUEST TASK INTO DETERMINATION RESULT DATA 1-(2) AND INPUT STATE OF REQUEST TASK INTO DETERMINATION RESULT DATA 1-(3) WHEN DETERMINATION RESULT DATA 1-(1) IS N
ST47
RETRIEVE SYSTEM CALL FOR TURNING REQUEST TASK AT N INTO READY STATE
ST48
INPUT RETRIEVAL L RESULT INTO (3) WHEN QUESTION DATA IS AT N
ST49
INPUT ISSUANCE TARGET OF SYSTEM CALL FOR TURNING REQUEST TASK INTO READY STATE, INTO QUESTION DATA (2) WHEN QUESTION DATA (1) IS N
ST50
N = N+1
ST51
RETRIEVAL REQUEST FLAG
ST52
GENERATE AND OUTPUT NORMAL APPLICATION PROGRAM SKELETON FROM VERIFICATION DATA

FIG.18

〈SYSTEM CALL CORRESPONDENCE TABLE〉

NO	SYSTEM CALL	CORRESPONDING SYSTEM CALL
1	sta_tsk	ext_tsk
2	slp_tsk	wup_tsk
3	wai_sem	sig_sem
⋮	⋮	⋮

FIG.19

●[PROCESSING 1]→[FIRST REQUEST]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	ISSUANCE ORIGINATION TASK STATE AFTER ISSUING	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	ISSUANCE DESTINATION TASK STATE AFTER ISSUING
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	3	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	slp_tsk	—	—	START UP	1	WAITING	—	—	—
4	TASK DISPATCH	—	—	—	START UP	1	—	TASK B	2	RUNNING
5	SYSTEM CALL	wup_tsk	—	—	TASK B	2	READY	START UP	1	READY
6	TASK DISPATCH	—	—	—	TASK B	2	—	START UP	1	RUNNING

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
1	7	7	TASK A

★

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.20

●[PROCESSING 2]→[PROCESSING COMPLETED]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	ISSUANCE ORIGINATION TASK	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	ISSUANCE DESTINATION TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK	
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	3	READY		
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY		
3	SYSTEM CALL	slp_tsk	—	—	START UP	1	WAITING	—	—	—		
4	TASK DISPATCH	—	—	—	START UP	1	—	TASK B	2	RUNNING		
5	SYSTEM CALL	wup_tsk	—	—	TASK B	2	RUNNING	START UP	1	READY		
6	TASK DISPATCH	—	—	—	TASK B	2	—	START UP	1	RUNNING		
7	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—		★
8	TASK DISPATCH	—	—	—	START UP	1	—	TASK B	2	RUNNING		★
9	SYSTEM CALL	ext_tsk	—	—	TASK B	2	DORMANT	—	—	—		★
10	TASK DISPATCH	—	—	—	TASK B	2	—	TASK A	3	RUNNING		★

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
1	7	7	TASK A

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK A	READY	★
1	TASK A	READY	★

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk	
1	START UP	ext_tsk	★
1	TASK B	ext_tsk	★

FIG.21

```
/*****************************************************
     File        : sample.c
     Data        : 1999/11/11
     Developer   : TOSHIBA
     Application  Skeleton
*****************************************************/
#include''itron.h''

#define  TASK_ID1        1
#define  TASK_ID2        2
#define  TASK_ID3        3

TASK  startup() :
TASK  TaskA() :
TASK  TaskB() :


TASK  startup() :
{
        ER  ercd ;

         ercd = sta_tsk(TASK_ID2,0) ;
         ercd = sta_tsk(TASK_ID3,0) ;
         ercd = slp_tsk() ;

         ext_tsk() ; ---------------------------------------- (a)
}

TASK  TaskA()
{

         for( ; : ){
         }

}

TASK  TaskB()
{
         ER  ercd ;

          ercd = wup_tsk(TASK_ID1) ;

          ext_tsk() ; ---------------------------------------- (b)
}
```

FIG.22

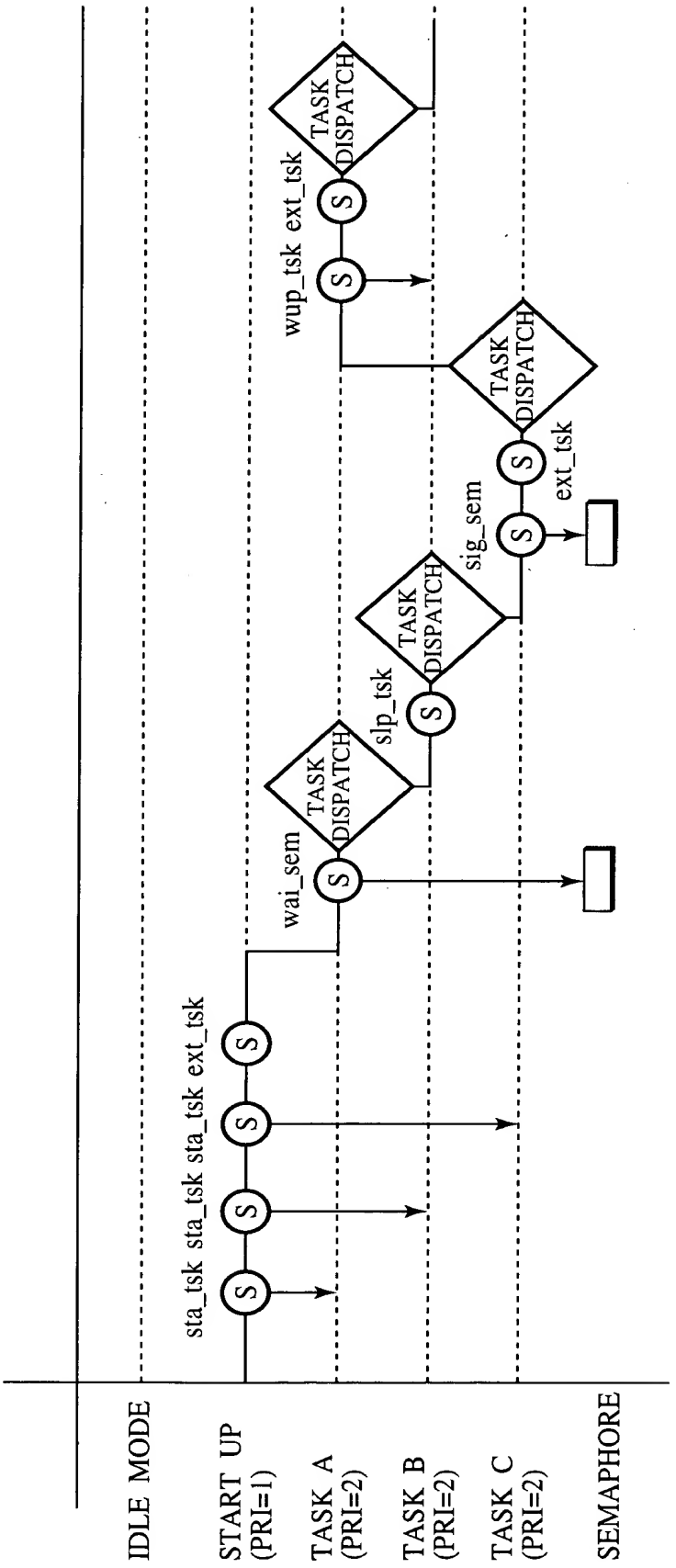

IDLE MODE
START UP (PRI=1)
TASK A (PRI=2)
TASK B (PRI=2)
TASK C (PRI=2)
SEMAPHORE
sta_tsk
sta_tsk
sta_tsk
ext_tsk
wai_sem
TASK DISPATCH
slp_tsk
TASK DISPATCH
sig_sem
TASK DISPATCH
ext_tsk
wup_tsk
ext_tsk
TASK DISPATCH
S

FIG.23

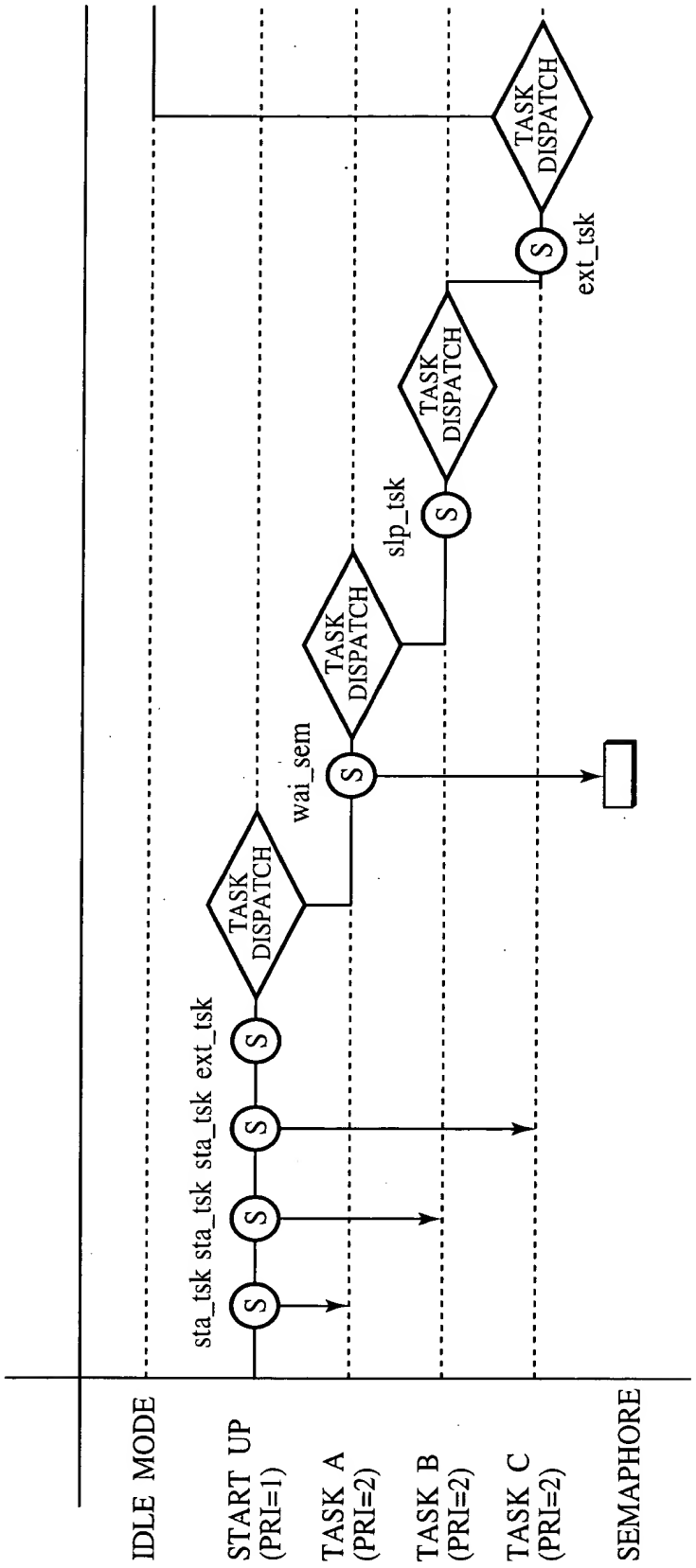

IDLE MODE
START UP (PRI=1)
TASK A (PRI=2)
TASK B (PRI=2)
TASK C (PRI=2)
SEMAPHORE
sta_tsk
sta_tsk
sta_tsk
ext_tsk
wai_sem
slp_tsk
ext_tsk
S
TASK DISPATCH

FIG.24

●[PROCESSING 1]→[FIRST REQUEST]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING
10	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—
11	TASK DISPATCH	—	—	—	TASK C	2	—	IDLE MODE	—	—

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
1	12	12	TASK B

★

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.25

●[PROCESSING 1]→[SECOND REQUEST]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING
10	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—
11	TASK DISPATCH	—	—	—	TASK C	2	—	IDLE MODE	—	—

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))	
1	12	12	TASK B	
2	6	7	TASK A	★

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE	
1	TASK A	wup_tsk	★

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	WAITING	★

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.26

●[PROCESSING 3]→[THIRD REQUEST]
〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	—	RUNNING
10	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—
11	TASK DISPATCH	—	—	—	TASK C	2	—	IDLE MODE	—	—

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))	
1	12	12	TASK B	
2	6	7	TASK A	
3	9	10	TASK C	★

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE	
1	TASK A	wup_tsk	
2	TASK C	sig_sem	★

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	WAITING	
2	TASK A	WAITING	★

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.27

●[PROCESSING 3]→[THIRD REQUEST]
〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING
10	SYSTEM CALL	sig_sem	—	—	TASK C	2	RUNNING	SEMAPHORE	1	— ★
11	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—
12	TASK DISPATCH	—	—	—	TASK C	2	—	TASK A	2	RUNNING

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
1	12	12	TASK B
2	6	7	TASK A ★
3	9	10	TASK C

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE
1	TASK A	wup_tsk ★
2	TASK C	sig_sem

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK
1	TASK B	WAITING
2	TASK A	RUNNING ★

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk

FIG.28

●[PROCESSING 5]→[FIFTH REQUEST]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK	
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY	
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY	
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY	
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—	
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING	
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—	
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING	
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—	
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING	
10	SYSTEM CALL	sig_sem	—	—	TASK C	2	RUNNING	SEMAPHORE	1	—	
11	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—	
12	TASK DISPATCH	—	—	—	TASK C	2	—	TASK A	2	RUNNING	
13	SYSTEM CALL	wup_tsk	—	—	TASK A	2	RUNNING	TASK B	2	READY	★
14	SYSTEM CALL	ext_tsk	—	—	TASK A	2	DORMANT				
15	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING	

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))	
1	12	12	TASK B	
2	6	7	TASK A	
3	9	10	TASK C	
1	13	13	TASK B	★
2	11	12	TASK A	

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE
1	TASK A	wup_tsk
2	TASK C	sig_sem

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	RUNNING	★
2	TASK A	RUNNING	

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk	
1	TASK A	ext_tsk	★

FIG.29

●[PROCESSING 6]→[PROCESSING COMPLETED]

〈VARIFICATION DATA〉

ORDER OF EVENTS	EVENT ATTRIBUTE	ISSUED SYSTEM CALL	HANDLER ATTRIBUTE	HANDLER NO.	ISSUANCE ORIGINATION TASK ID	ISSUANCE ORIGINATION TASK PRIORITY	TASK STATE AFTER ISSUING ISSUANCE ORIGINATION TASK	ISSUANCE DESTINATION TASK ID (ISSUANCE DESTINATION RESOURCE)	ISSUANCE DESTINATION TASK PRIORITY (ISSUANCE DESTINATION ID)	TASK STATE AFTER ISSUING ISSUANCE DESTINATION TASK	
1	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK A	2	READY	
2	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK B	2	READY	
3	SYSTEM CALL	sta_tsk	—	—	START UP	1	RUNNING	TASK C	2	READY	
4	SYSTEM CALL	ext_tsk	—	—	START UP	1	DORMANT	—	—	—	
5	TASK DISPATCH	—	—	—	START UP	1	—	TASK A	2	RUNNING	
6	SYSTEM CALL	wai_sem	—	—	TASK A	2	WAITING	SEMAPHORE	1	—	
7	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING	
8	SYSTEM CALL	slp_tsk	—	—	TASK B	2	WAITING	—	—	—	
9	TASK DISPATCH	—	—	—	TASK B	2	—	TASK C	2	RUNNING	
10	SYSTEM CALL	sig_sem	—	—	TASK C	2	RUNNING	SEMAPHORE	1	—	
11	SYSTEM CALL	ext_tsk	—	—	TASK C	2	DORMANT	—	—	—	
12	TASK DISPATCH	—	—	—	TASK C	2	—	TASK A	2	RUNNING	
13	SYSTEM CALL	wup_tsk	—	—	TASK A	2	RUNNING	TASK B	2	READY	
14	SYSTEM CALL	ext_tsk	—	—	TASK A	2	DORMANT				★
15	TASK DISPATCH	—	—	—	TASK A	2	—	TASK B	2	RUNNING	★

〈COMPARISON DATA〉

N	PRIOR EVENT	POSTERIOR EVENT	ITEM (TASK(y))
1	12	12	TASK B
2	6	7	TASK A
3	9	10	TASK C
1	13	13	TASK B
2	6	7	TASK A

〈DEFECT SOLUTION QUESTION DATA〉

(1)N	(2)ISSUANCE TARGET TO WHICH SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE IS ISSUED	(3)SYSTEM CALL FOR TURNING REQUEST TASK IN READY STATE
1	TASK A	wup_tsk
2	TASK C	sig_sem

〈DETERMINATION RESULT DATA 1〉

(1)N	(2)REQUEST TASK	(3)STATE OF REQUEST TASK	
1	TASK B	READY	★
2	TASK A	RUNNING	

〈DETERMINATION RESULT DATA 2〉

(1)N	(2)TASK IN RUN STATE AT THE END OF EVENTS	(3)ext_tsk
1	TASK A	ext_tsk

FIG.30

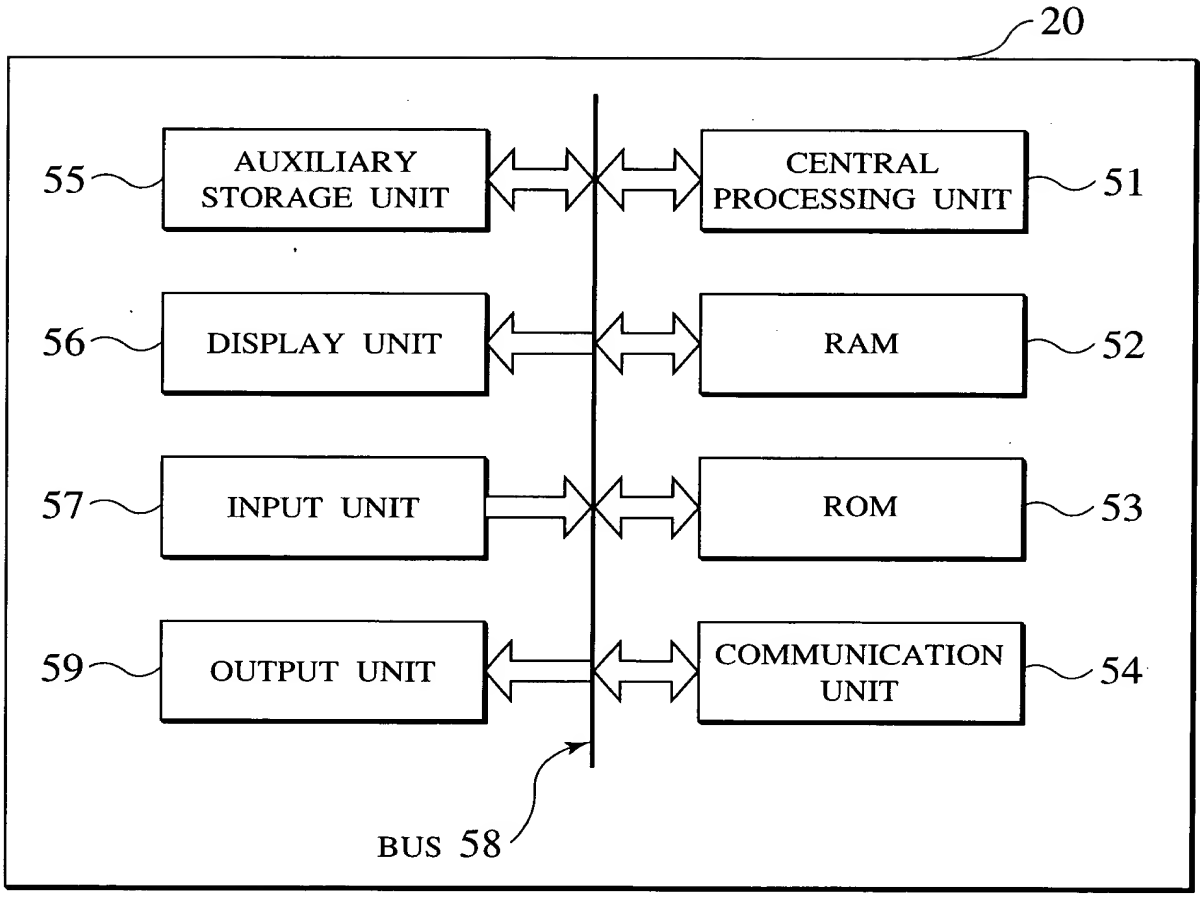

20
55
AUXILIARY STORAGE UNIT
CENTRAL PROCESSING UNIT
51
56
DISPLAY UNIT
RAM
52
57
INPUT UNIT
ROM
53
59
OUTPUT UNIT
COMMUNICATION UNIT
54
BUS 58

FIG.31

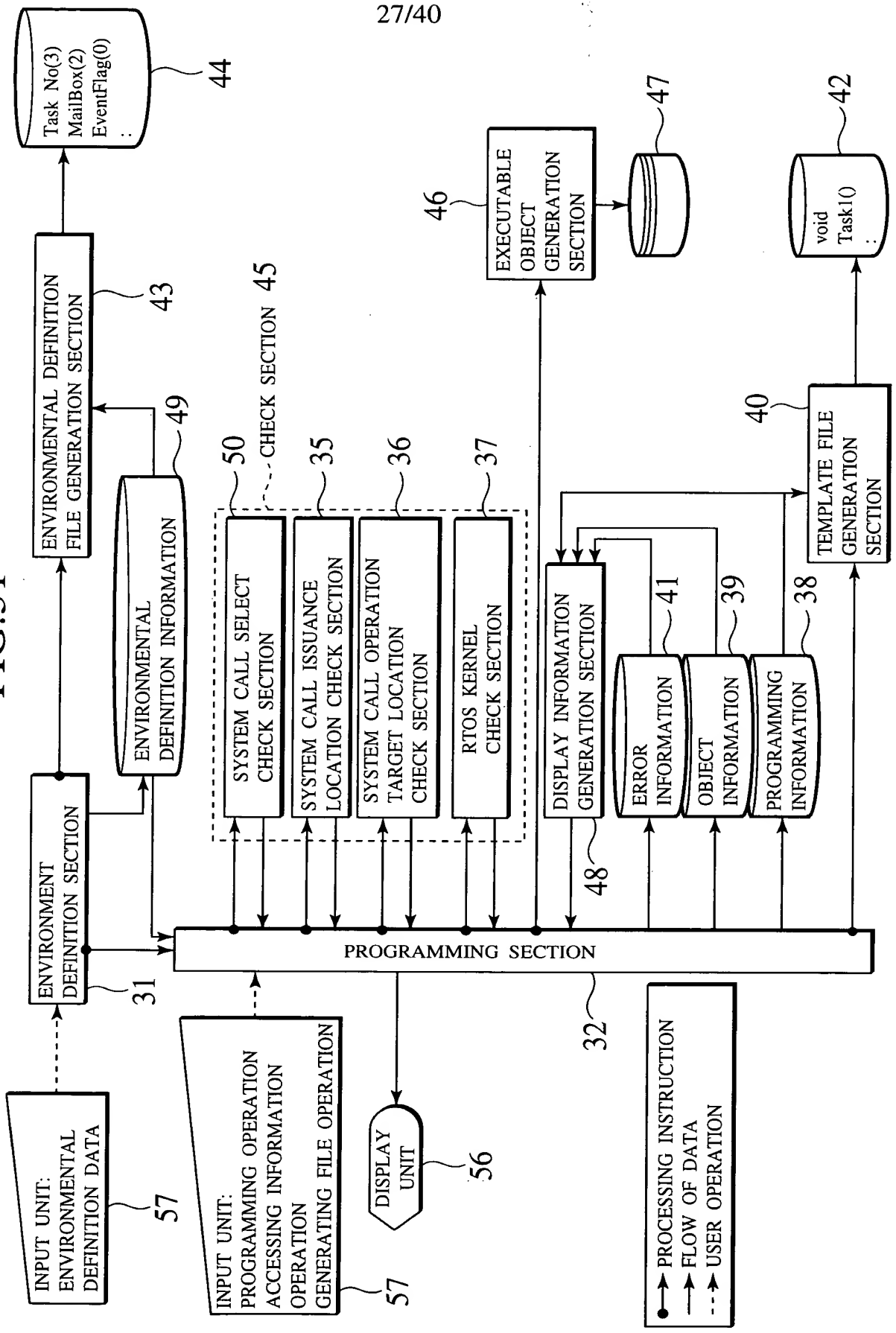

INPUT UNIT:
ENVIRONMENTAL
DEFINITION DATA
57
ENVIRONMENT
DEFINITION SECTION
31
ENVIRONMENTAL DEFINITION
FILE GENERATION SECTION
43
Task No(3)
MailBox(2)
EventFlag(0)
:
44
ENVIRONMENTAL
DEFINITION INFORMATION
49
CHECK SECTION 45
50
SYSTEM CALL SELECT
CHECK SECTION
35
SYSTEM CALL ISSUANCE
LOCATION CHECK SECTION
36
SYSTEM CALL OPERATION
TARGET LOCATION
CHECK SECTION
37
RTOS KERNEL
CHECK SECTION
46
EXECUTABLE
OBJECT
GENERATION
SECTION
47
DISPLAY INFORMATION
GENERATION SECTION
48
ERROR
INFORMATION
41
OBJECT
INFORMATION
39
PROGRAMMING
INFORMATION
38
TEMPLATE FILE
GENERATION
SECTION
40
void
Task1()
:
42
PROGRAMMING SECTION
32
INPUT UNIT:
PROGRAMMING OPERATION
ACCESSING INFORMATION
OPERATION
GENERATING FILE OPERATION
57
DISPLAY
UNIT
56
PROCESSING INSTRUCTION
FLOW OF DATA
USER OPERATION

FIG.32

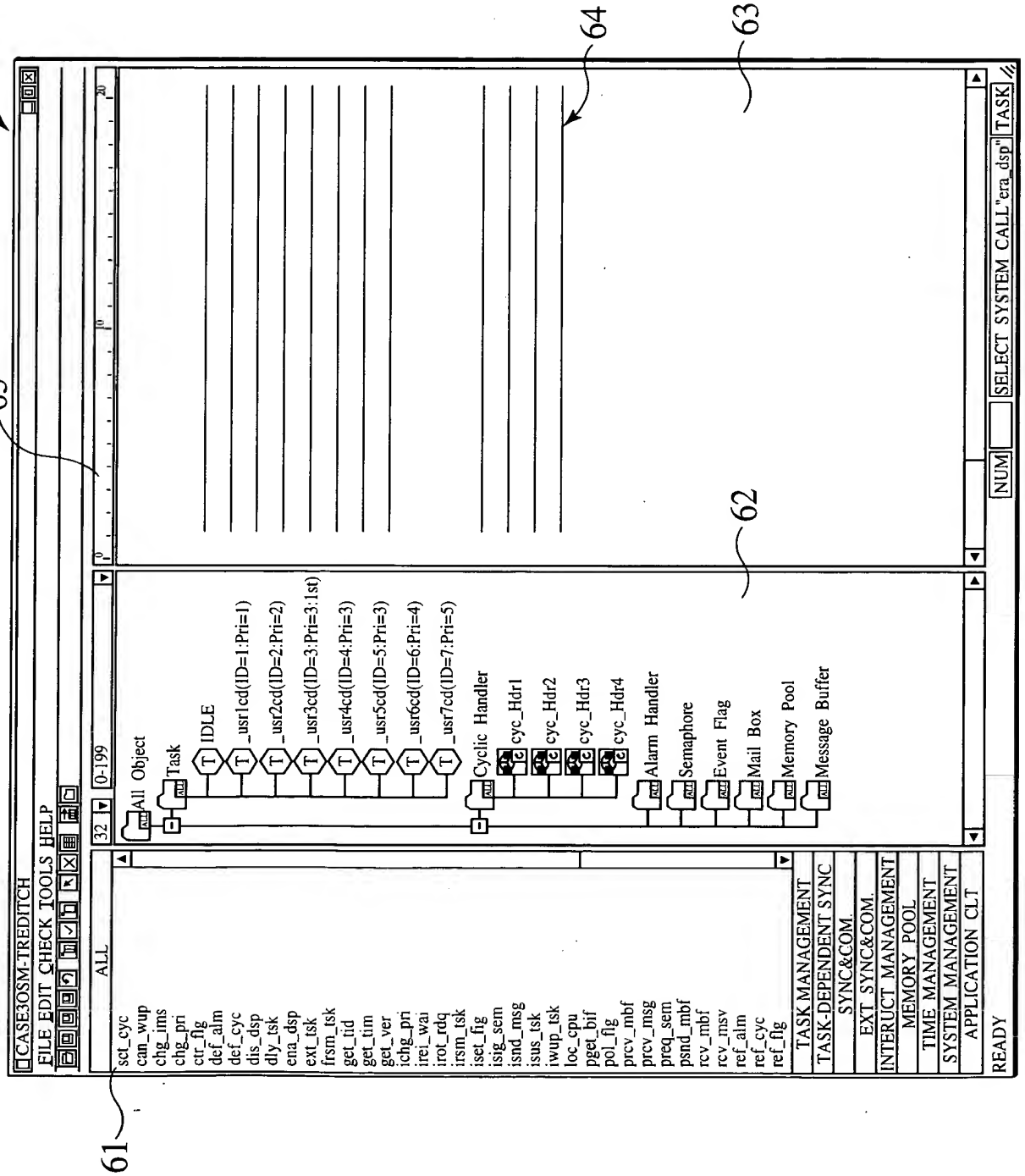

70
65
64
63
62
61
CASE3OSM-TREDITCH
FILE EDIT CHECK TOOLS HELP
ALL
32
0-199
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
Alarm Handler
Semaphore
Event Flag
Mail Box
Memory Pool
Message Buffer
sct_cyc
can_wup
chg_ims
chg_pri
ctr_flg
def_alm
def_cyc
dis_dsp
dly_tsk
ena_dsp
ext_tsk
frsm_tsk
get_tid
get_tim
get_ver
ichg_pri
irel_wai
irot_rdq
irsm_tsk
iset_flg
isig_sem
isnd_msg
isus_tsk
iwup_tsk
loc_cpu
pget_blf
pol_flg
prcv_mbf
prcv_msg
preq_sem
psnd_mbf
rcv_mbf
rcv_msv
ref_alm
ref_cyc
ref_flg
TASK MANAGEMENT
TASK-DEPENDENT SYNC
SYNC&COM
EXT SYNC&COM.
INTERUCT MANAGEMENT
MEMORY POOL
TIME MANAGEMENT
SYSTEM MANAGEMENT
APPLICATION CLT
READY
NUM
SELECT SYSTEM CALL"era_dsp"
TASK

FIG.33

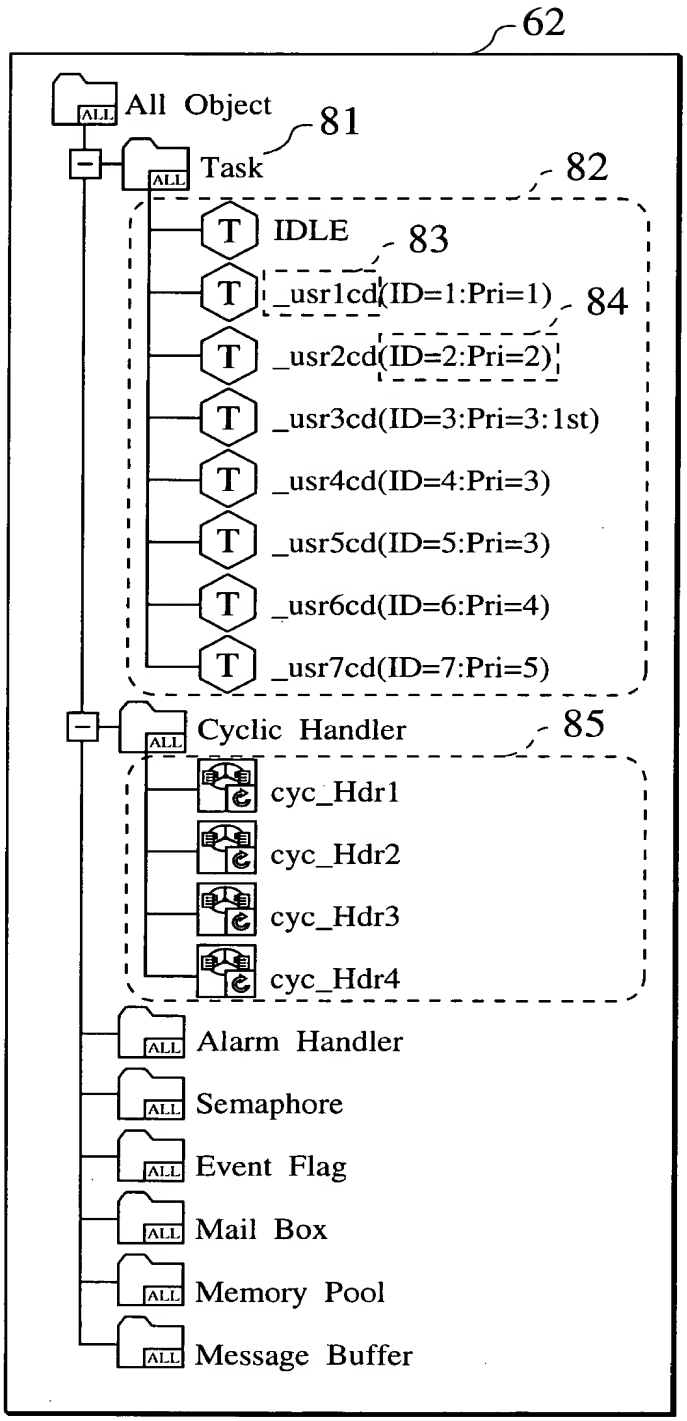

62
All Object
81
Task
82
IDLE
83
_usr1cd(ID=1:Pri=1)
84
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
85
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
Alarm Handler
Semaphore
Event Flag
Mail Box
Memory Pool
Message Buffer

FIG.34

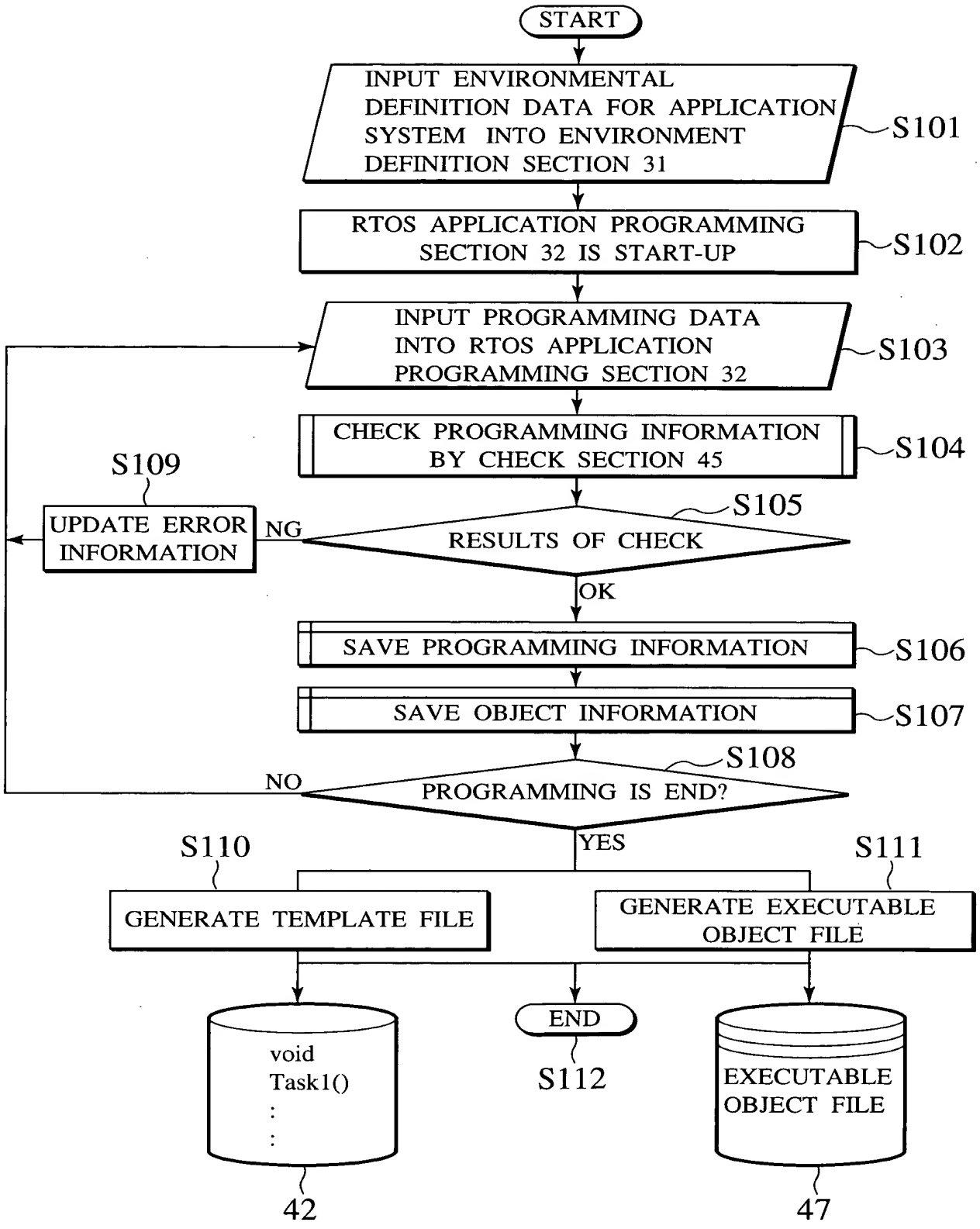

START
INPUT ENVIRONMENTAL DEFINITION DATA FOR APPLICATION SYSTEM INTO ENVIRONMENT DEFINITION SECTION 31
S101
RTOS APPLICATION PROGRAMMING SECTION 32 IS START-UP
S102
INPUT PROGRAMMING DATA INTO RTOS APPLICATION PROGRAMMING SECTION 32
S103
CHECK PROGRAMMING INFORMATION BY CHECK SECTION 45
S104
S105
RESULTS OF CHECK
NG
S109
UPDATE ERROR INFORMATION
OK
SAVE PROGRAMMING INFORMATION
S106
SAVE OBJECT INFORMATION
S107
S108
PROGRAMMING IS END?
NO
YES
S110
GENERATE TEMPLATE FILE
S111
GENERATE EXECUTABLE OBJECT FILE
void
Task1()
:
:
42
END
S112
EXECUTABLE OBJECT FILE
47

FIG.35

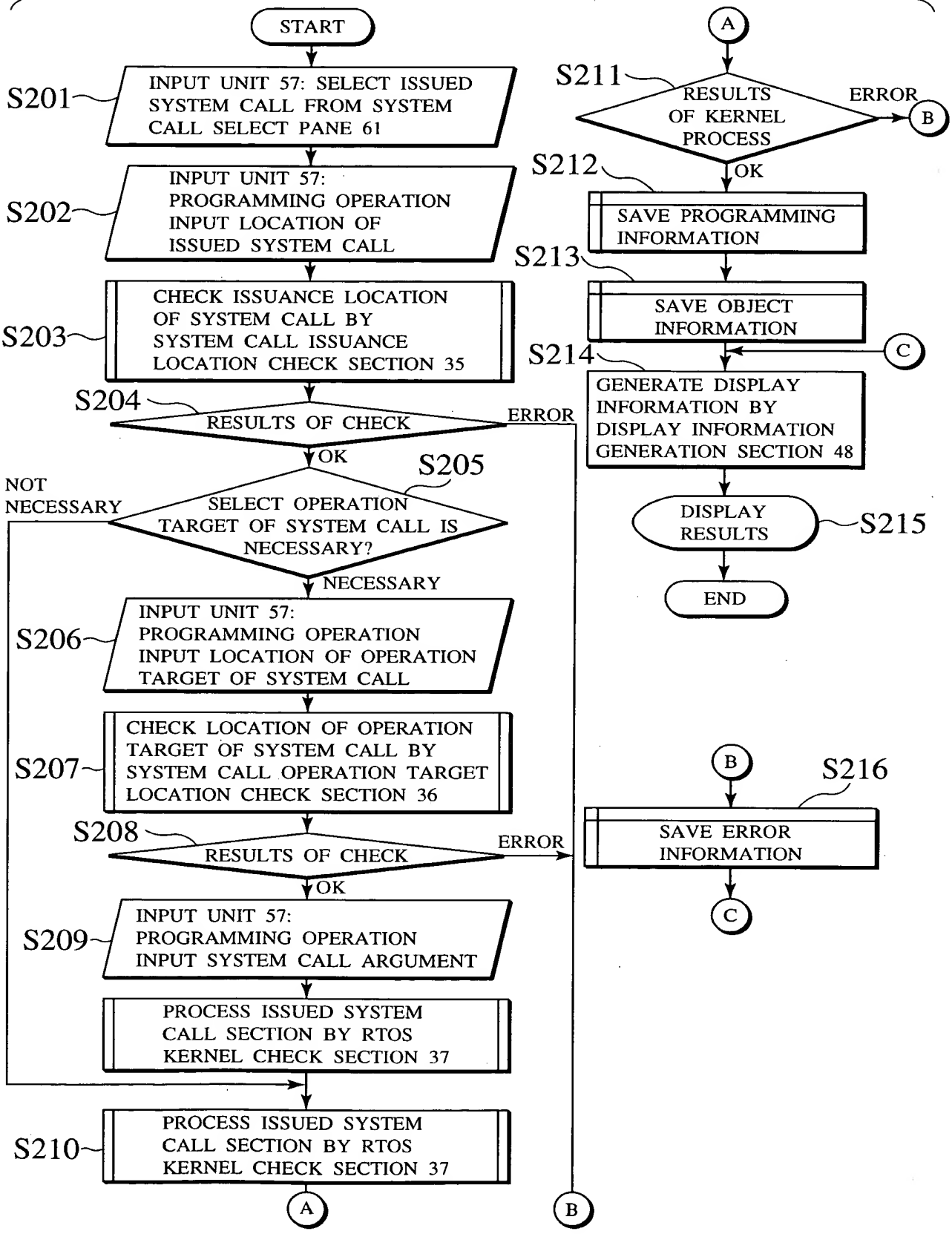

START
S201
INPUT UNIT 57: SELECT ISSUED SYSTEM CALL FROM SYSTEM CALL SELECT PANE 61
S202
INPUT UNIT 57: PROGRAMMING OPERATION INPUT LOCATION OF ISSUED SYSTEM CALL
S203
CHECK ISSUANCE LOCATION OF SYSTEM CALL BY SYSTEM CALL ISSUANCE LOCATION CHECK SECTION 35
S204
RESULTS OF CHECK
ERROR
OK
S205
NOT NECESSARY
SELECT OPERATION TARGET OF SYSTEM CALL IS NECESSARY?
NECESSARY
S206
INPUT UNIT 57: PROGRAMMING OPERATION INPUT LOCATION OF OPERATION TARGET OF SYSTEM CALL
S207
CHECK LOCATION OF OPERATION TARGET OF SYSTEM CALL BY SYSTEM CALL OPERATION TARGET LOCATION CHECK SECTION 36
S208
RESULTS OF CHECK
ERROR
OK
S209
INPUT UNIT 57: PROGRAMMING OPERATION INPUT SYSTEM CALL ARGUMENT
PROCESS ISSUED SYSTEM CALL SECTION BY RTOS KERNEL CHECK SECTION 37
S210
PROCESS ISSUED SYSTEM CALL SECTION BY RTOS KERNEL CHECK SECTION 37
A
B
A
S211
RESULTS OF KERNEL PROCESS
ERROR
B
OK
S212
SAVE PROGRAMMING INFORMATION
S213
SAVE OBJECT INFORMATION
C
S214
GENERATE DISPLAY INFORMATION BY DISPLAY INFORMATION GENERATION SECTION 48
DISPLAY RESULTS
S215
END
B
S216
SAVE ERROR INFORMATION
C

FIG.36

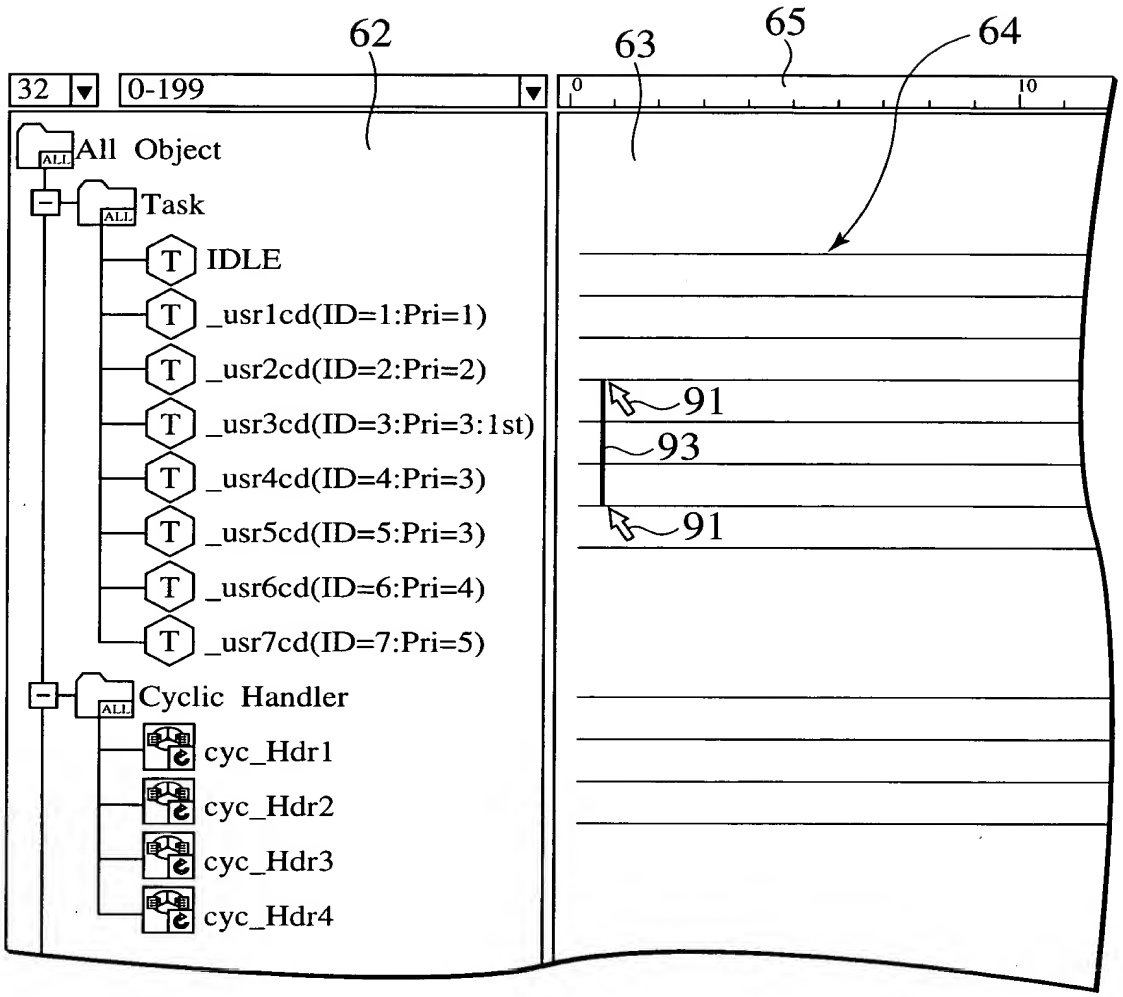

62
63
65
64
32
0-199
0
10
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
91
93
91

FIG.37

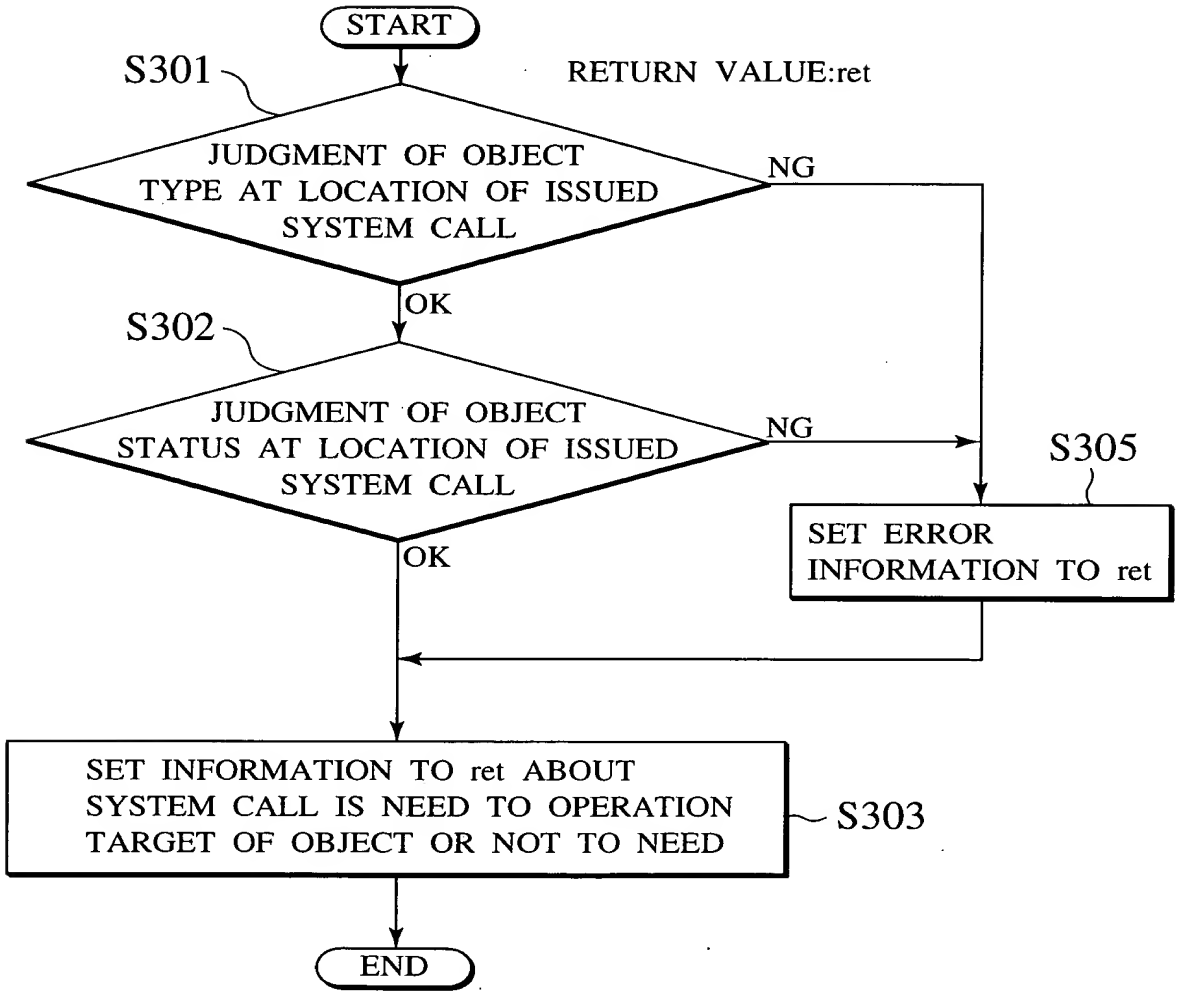

START
S301
RETURN VALUE:ret
JUDGMENT OF OBJECT TYPE AT LOCATION OF ISSUED SYSTEM CALL
NG
OK
S302
JUDGMENT OF OBJECT STATUS AT LOCATION OF ISSUED SYSTEM CALL
NG
OK
S305
SET ERROR INFORMATION TO ret
SET INFORMATION TO ret ABOUT SYSTEM CALL IS NEED TO OPERATION TARGET OF OBJECT OR NOT TO NEED
S303
END

FIG.38

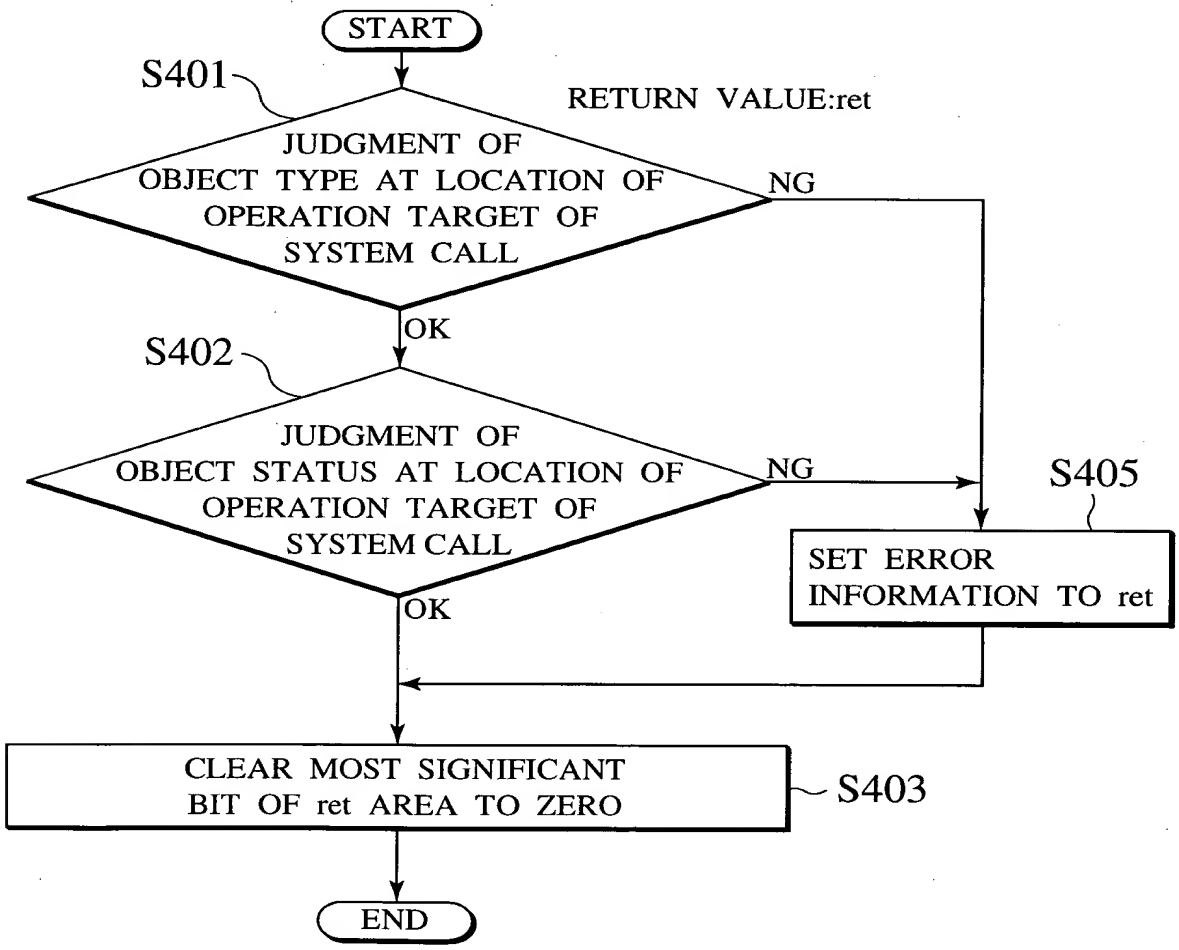

START
S401
RETURN VALUE:ret
JUDGMENT OF OBJECT TYPE AT LOCATION OF OPERATION TARGET OF SYSTEM CALL
NG
OK
S402
JUDGMENT OF OBJECT STATUS AT LOCATION OF OPERATION TARGET OF SYSTEM CALL
NG
S405
SET ERROR INFORMATION TO ret
OK
CLEAR MOST SIGNIFICANT BIT OF ret AREA TO ZERO
S403
END

FIG.39

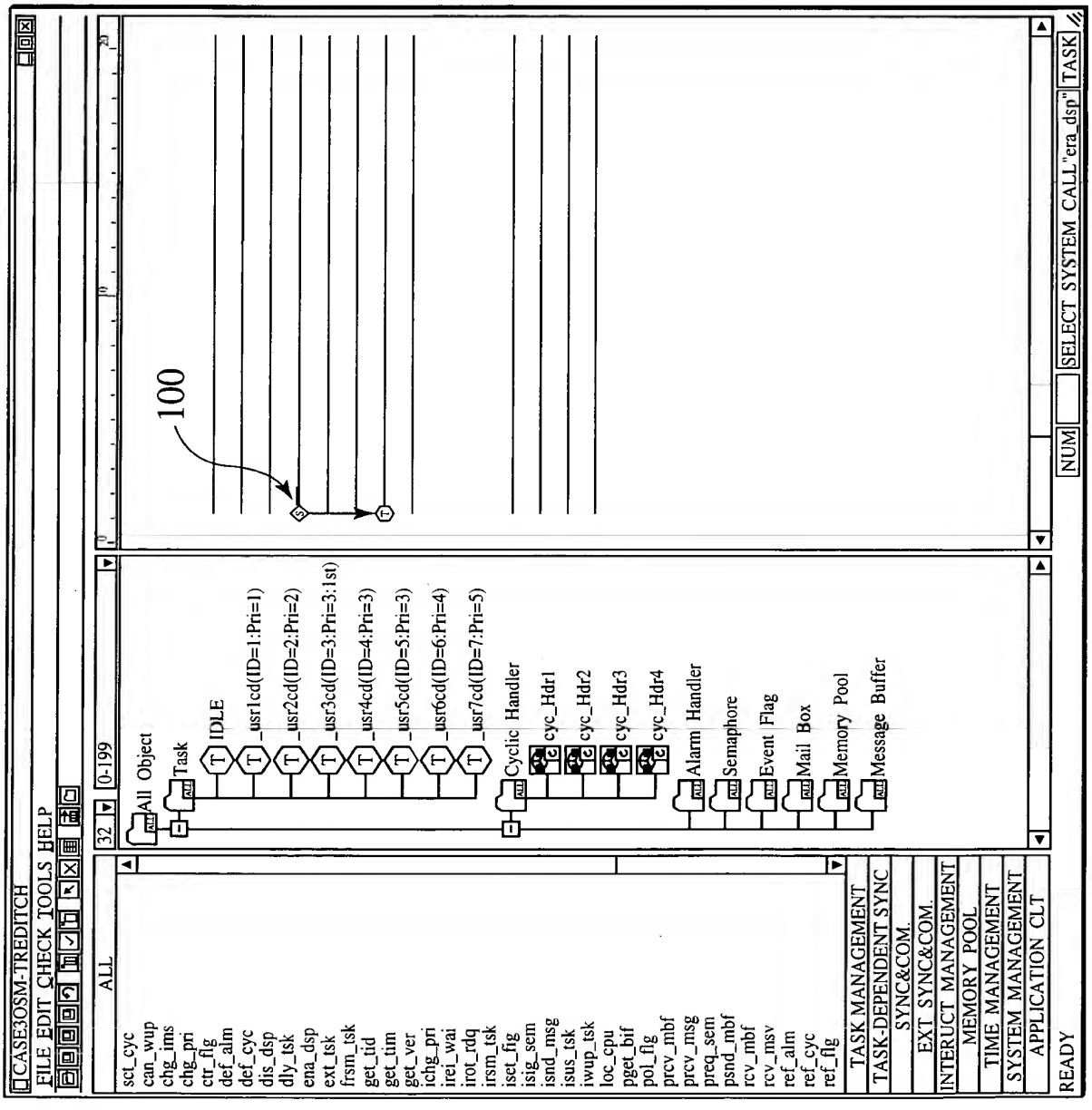

CASE3OSM-TREDITCH
FILE EDIT CHECK TOOLS HELP
ALL
32
0-199
sct_cyc
can_wup
chg_ims
chg_pri
ctr_flg
def_alm
def_cyc
dis_dsp
dly_tsk
ena_dsp
ext_tsk
frsm_tsk
get_tid
get_tim
get_ver
ichg_pri
irel_wai
irot_rdq
irsm_tsk
iset_flg
isig_sem
isnd_msg
isus_tsk
iwup_tsk
loc_cpu
pget_bif
pol_flg
prcv_mbf
prcv_msg
preq_sem
psnd_mbf
rcv_mbf
rcv_msv
ref_alm
ref_cyc
ref_flg
TASK MANAGEMENT
TASK-DEPENDENT SYNC
SYNC&COM.
EXT SYNC&COM.
INTERUCT MANAGEMENT
MEMORY POOL
TIME MANAGEMENT
SYSTEM MANAGEMENT
APPLICATION CLT
All Object
Task
IDLE
usr1cd(ID=1:Pri=1)
usr2cd(ID=2:Pri=2)
usr3cd(ID=3:Pri=3:1st)
usr4cd(ID=4:Pri=3)
usr5cd(ID=5:Pri=3)
usr6cd(ID=6:Pri=4)
usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
Alarm Handler
Semaphore
Event Flag
Mail Box
Memory Pool
Message Buffer
100
READY
NUM
SELECT SYSTEM CALL"era_dsp"
TASK

FIG.40

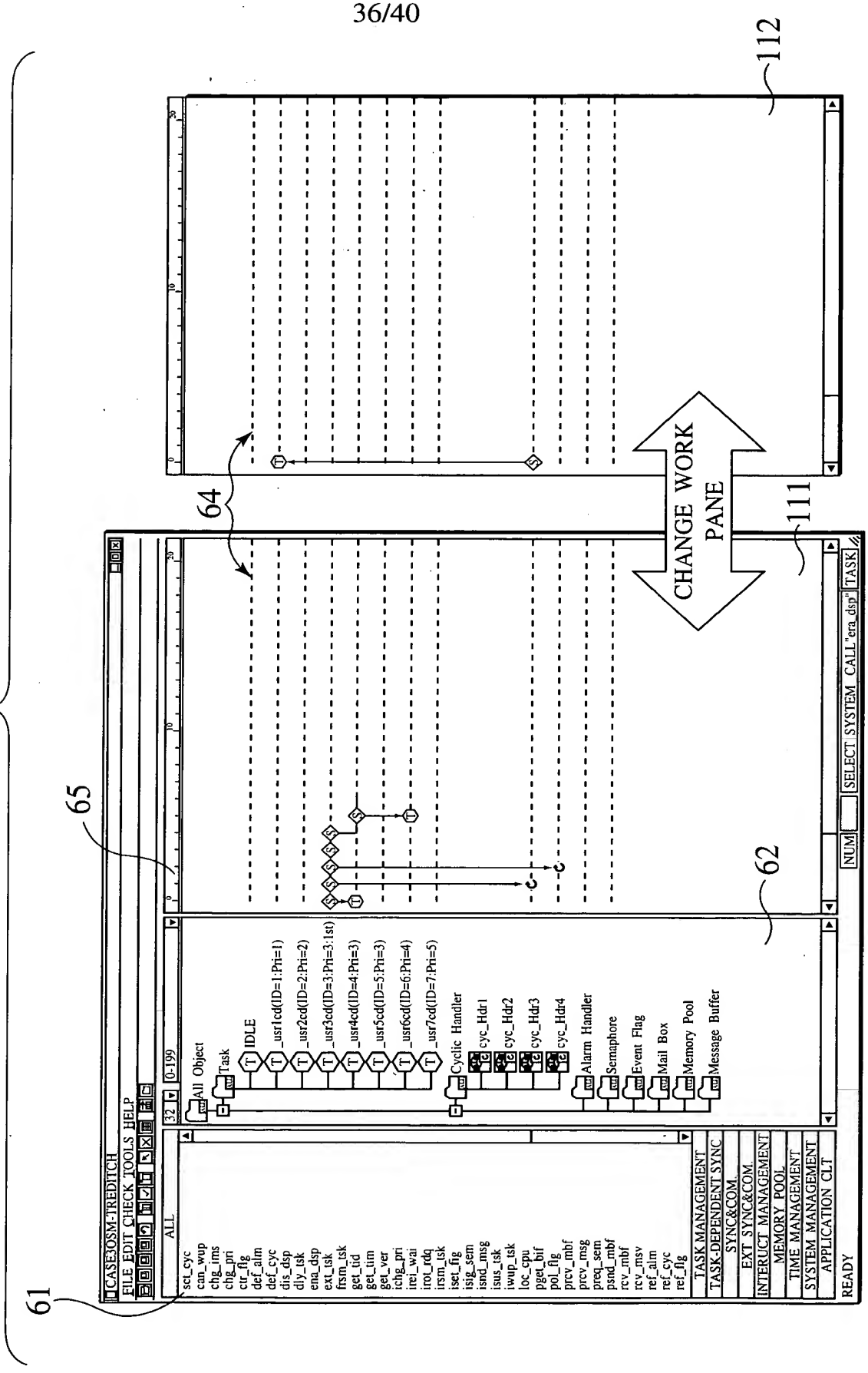

61
CASE3OSM-TREDITCH
FILE EDIT CHECK TOOLS HELP
ALL
sct_cyc
can_wup
chg_ims
chg_pri
ctr_flg
def_alm
def_cyc
dis_dsp
dly_tsk
ena_dsp
ext_tsk
frsm_tsk
get_tid
get_tim
get_ver
ichg_pri
irel_wai
irot_rdq
irsm_tsk
iset_flg
isig_sem
isnd_msg
isus_tsk
iwup_tsk
loc_cpu
pget_blf
pol_flg
prcv_mbf
prcv_msg
preq_sem
psnd_mbf
rcv_mbf
rcv_msv
ref_alm
ref_cyc
ref_flg
TASK MANAGEMENT
TASK-DEPENDENT SYNC
SYNC&COM.
EXT SYNC&COM.
INTERUCT MANAGEMENT
MEMORY POOL
TIME MANAGEMENT
SYSTEM MANAGEMENT
APPLICATION CLT
READY
32
0-199
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
Alarm Handler
Semaphore
Event Flag
Mail Box
Memory Pool
Message Buffer
65
64
62
111
112
CHANGE WORK PANE
NUM
SELECT SYSTEM CALL"era_dsp"
TASK

FIG.41

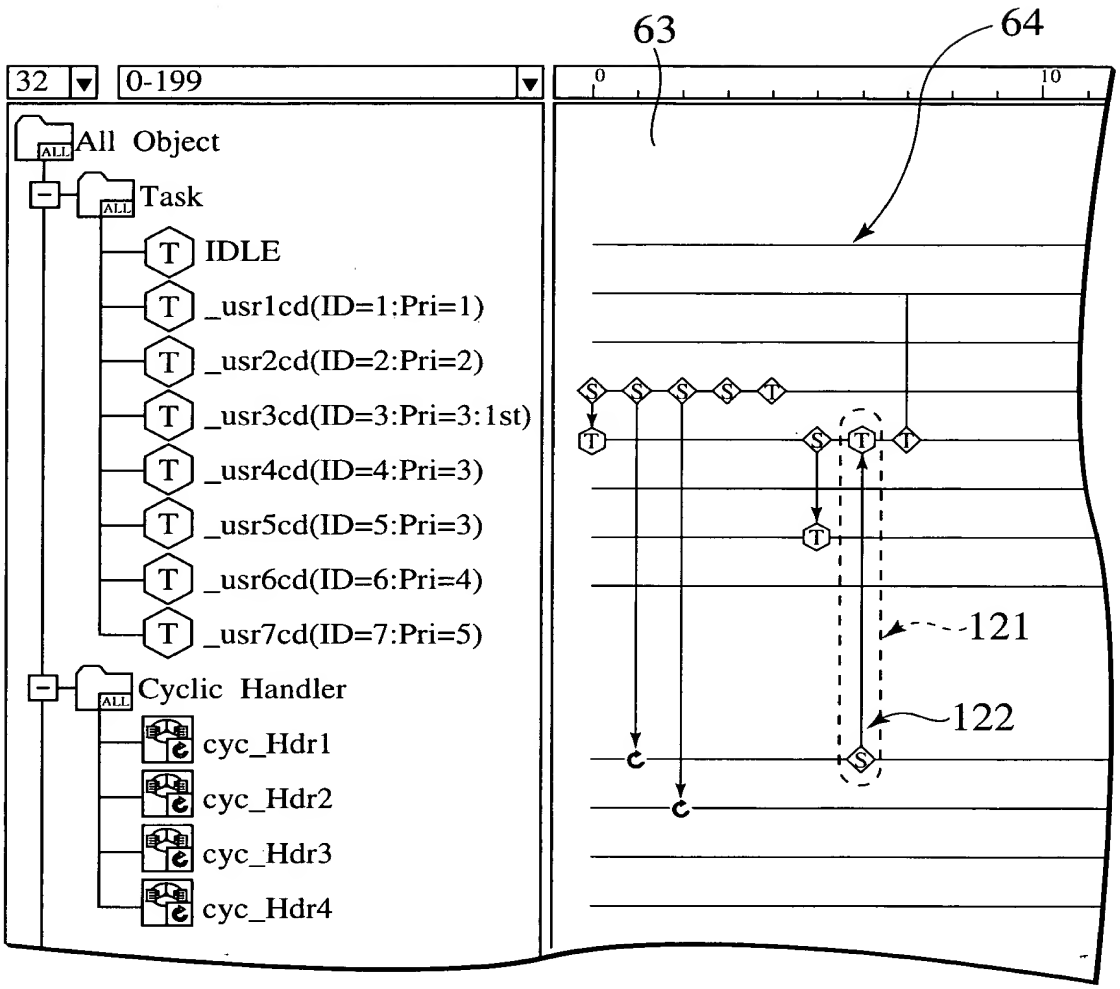

63
64
32
0-199
0
10
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=3)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
121
122

FIG.42

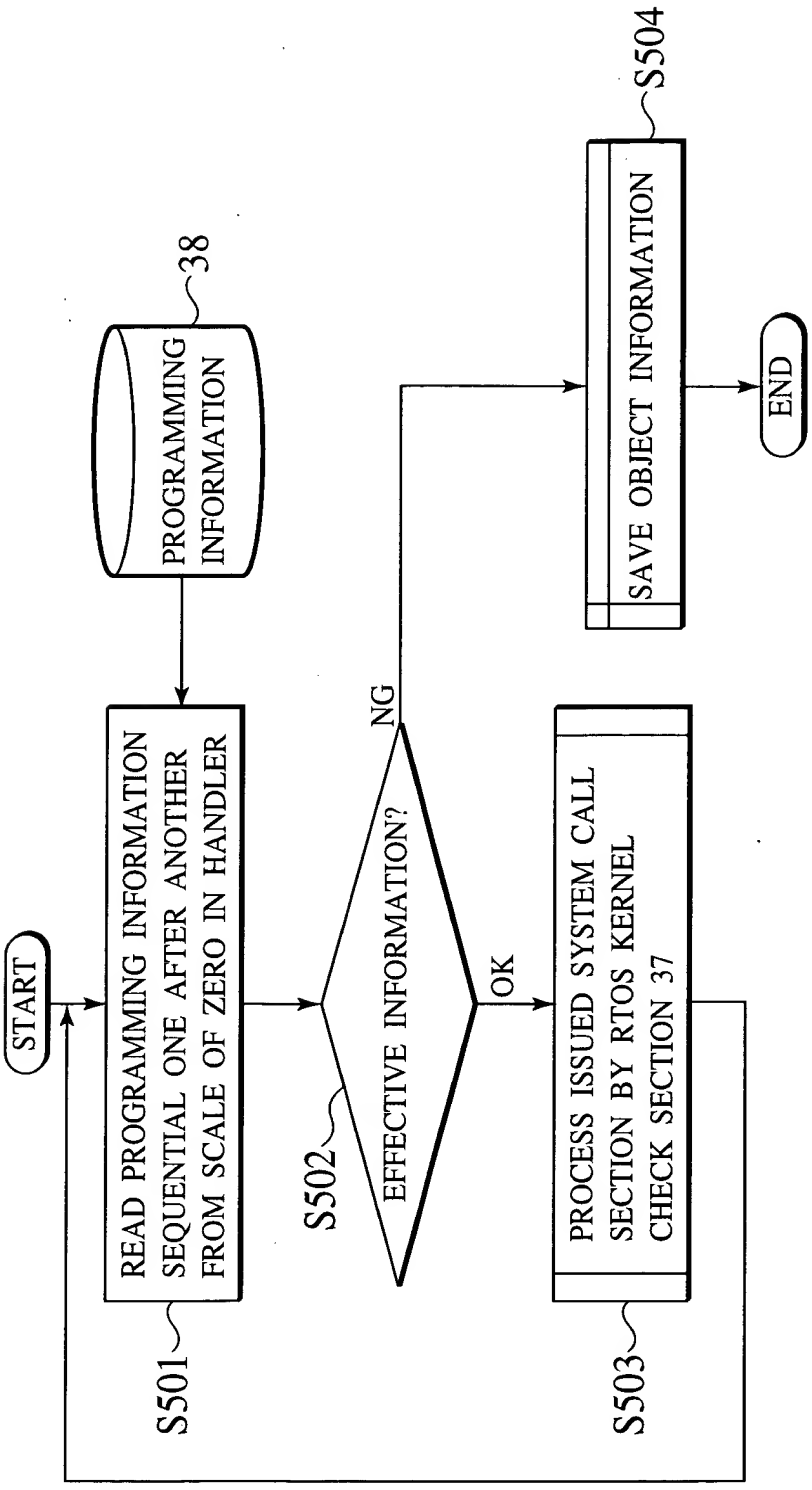
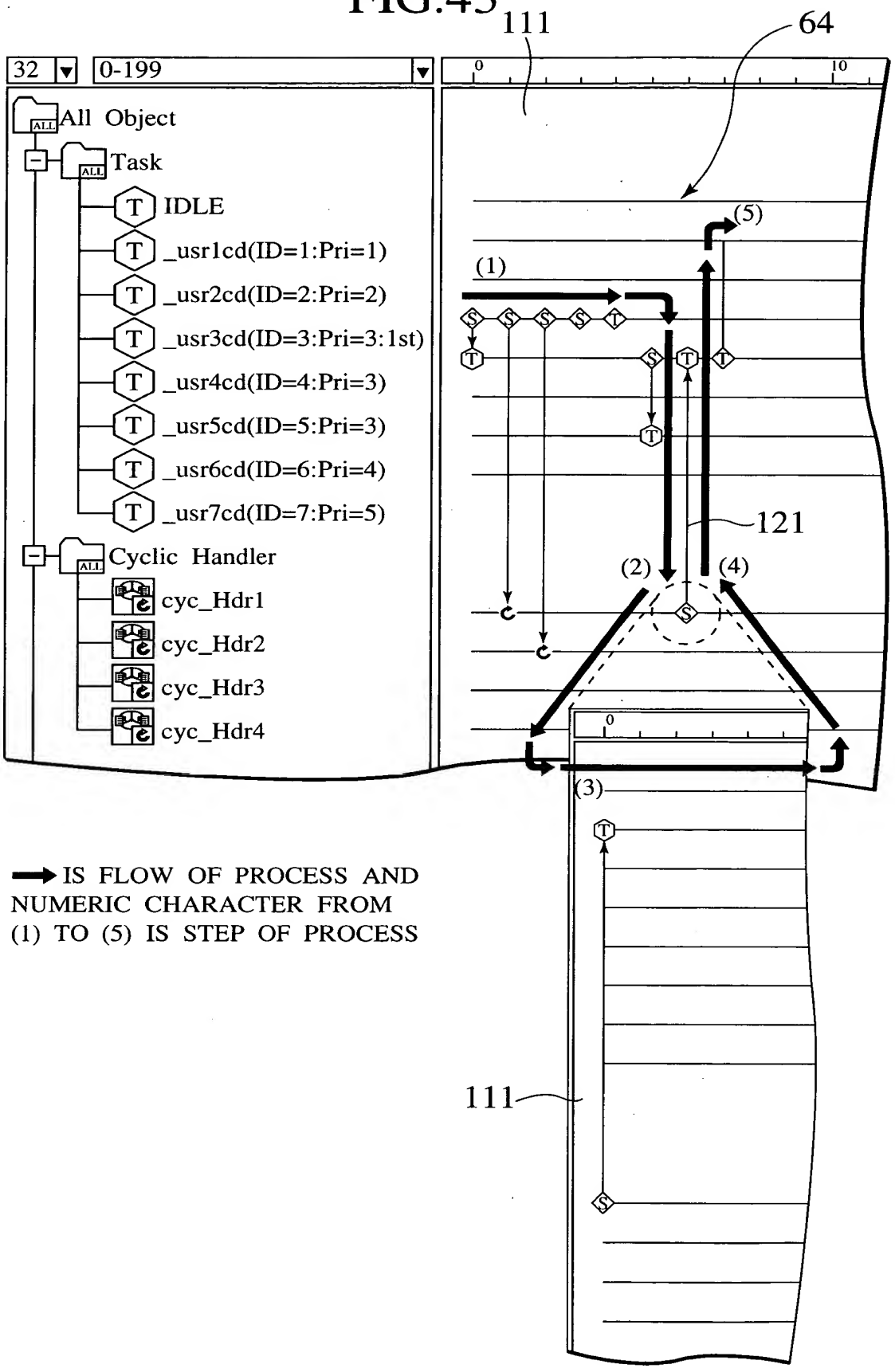
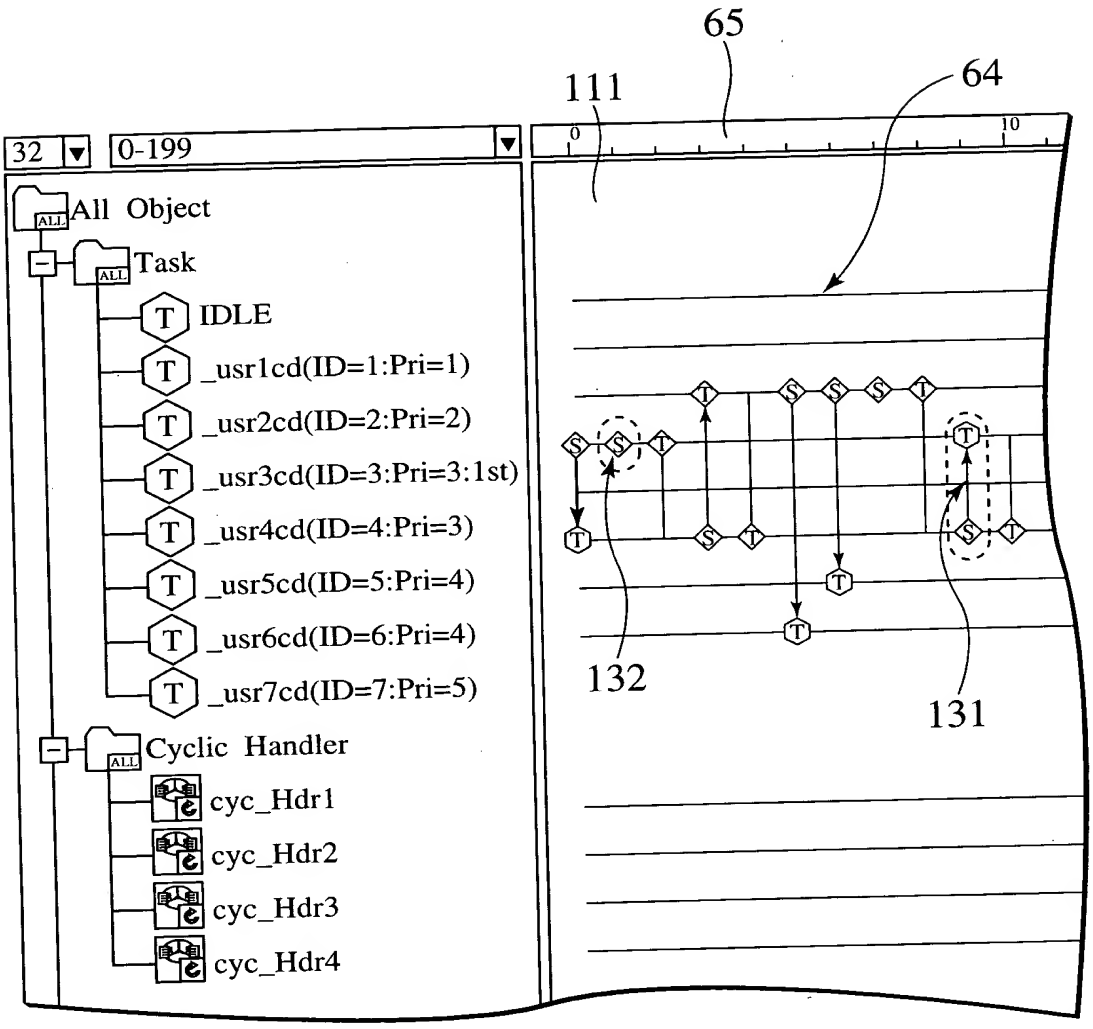

START
READ PROGRAMMING INFORMATION SEQUENTIAL ONE AFTER ANOTHER FROM SCALE OF ZERO IN HANDLER
S501
EFFECTIVE INFORMATION?
S502
NG
OK
PROCESS ISSUED SYSTEM CALL SECTION BY RTOS KERNEL CHECK SECTION 37
S503
SAVE OBJECT INFORMATION
S504
END
PROGRAMMING INFORMATION
38

FIG.43



→ IS FLOW OF PROCESS AND NUMERIC CHARACTER FROM (1) TO (5) IS STEP OF PROCESS

FIG.44


65
111
64
32
0-199
0
10
All Object
Task
IDLE
_usr1cd(ID=1:Pri=1)
_usr2cd(ID=2:Pri=2)
_usr3cd(ID=3:Pri=3:1st)
_usr4cd(ID=4:Pri=3)
_usr5cd(ID=5:Pri=4)
_usr6cd(ID=6:Pri=4)
_usr7cd(ID=7:Pri=5)
Cyclic Handler
cyc_Hdr1
cyc_Hdr2
cyc_Hdr3
cyc_Hdr4
132
131